9-6920-357-24+P

TECHNICAL MANUAL

ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

(INCLUDES DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)

FOR

TRAINER, LASER GUNNERY: M55 W/E
(6920-00-689-4036)
LIN X00525
AND

TRAINER, FIELD ARTILLERY:
DIRECT FIRE (W/O LASER)
(6920-01-026-0136)
LIN Z91529

HEADQUARTERS, DEPARTMENT OF THE ARMY
JUNE 1979

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AR 911628

WARNING

The laser beam is safe when the trainer is operated in the FLASH MODE.

Precautions are required to prevent possible eye damage when the trainer is operated in the CONTINUOUS MODE. Staring into the laser output or staring at the laser light reflection from a mirror-like surface can be hazardous out to a range of 4 kilometers.

Observe the following precautions when the trainer is operated in the CONTINUOUS MODE.

Do not look into the laser beam or at mirror-like reflections of the laser beam. Staring into the laser beam is specifically prohibited.

Do not fire trainer at personnel.

Do not fire trainer at mirror-like surfaces.

Do not operate the trainer in the CONTINUOUS MODE unless a large target or other opaque backstop exists to terminate the beam.

TB-MED-279 is the source document for laser safety.

Operation of this trainer involves the use of internal high voltages of 1,200 to 10,000 volts that can cause death.

Back of trainer should not be opened during operation except by authorized maintenance personnel.

Exposed high voltage is limited to the female high voltage connector on the high voltage power supply module and the corresponding male connector on the plasma tube. However, circuit failures can cause dangerous potentials to be present elsewhere.

WARNING

DANGEROUS CHEMICALS

FINAL INSPECTION

Dry cleaning solvent or mineral spirits paint thinner is flammable and should not be used near an open flame. Fire extinguishers should be provided. Use flammable material only in well-ventilated places.

Trichloroethane is toxic. Avoid breathing its fumes or exposure to skin.

Make sure the trainer LASER SAFE-FIRE circuit breaker switch is set to SAFE and the TRIGGER ON lamp is extinguished before final-testing the unit.

Avoid looking directly into the laser beam; this may cause permanent eye damage.

Observe all range safety regulations during operation.

Personnel routinely performing maintenance at the DS, GS and Depot level are required to receive eye examinations in accordance with AR 40-46.

Technical Manual
No. 9-6920-357-24&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 20 June 1979

Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List (Includes Depot Maintenance Repair Parts and Special Tools) for TRAINER, LASER GUNNERY: M55 W/E (6920-00-689-4036) LIN X00525 and TRAINER, FIELD ARTILLERY: DIRECT FIRE (W/O LASER) (6920-01-026-0136) LIN Z91529

Current as of August 1978

Reporting Errors and Recommending Improvements. You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publication and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Armament Materiel Readiness Command, ATTN: DRSAR-MAS, Rock Island, IL 61299. A reply will be furnished to you.

*This manual supercedes TM 9-6920-357-24&P, September 1975, including all changes.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. **Scope.** This manual is for your use in performing organizational, direct, and general support maintenance of the laser gunnery trainer M55 w/equipment referred to hereafter as laser, and the field artillery direct fire trainer w/o laser referred to as ADFT in the rest of this manual.

1-2. **Maintenance Forms and Records.** Maintenance forms and records which you are required to use are listed and explained in TM 38-750.

1-3. **Administrative Storage.** Refer to TM 740-90-1.

1-4. **Destruction of Army Materiel to Prevent Enemy Use.** Not applicable.

1-5. **Quality Assurance/Quality Control.** Not applicable.

1-6. **Reporting Equipment Improvement Recommendations (EIR).** EIR's will be prepared on SF 368, Quality Deficiency Report (QDR). Instructions for preparing EIR's are provided in TM 38-750, The Army Maintenance Management System. EIR's should be mailed directly to Commander, US Army Armament Materiel Readiness Command, Attn: DRSAR-MAO, Rock Island, IL 61299. A reply will be furnished directly to you.

Section II. DESCRIPTION AND TABULATED DATA

1-7. **Description.** A general description of the laser and ADFT and their identification are in TM 9-6920-357-10-1 and 2. The maintenance paragraphs of these manuals contain descriptions of their components.

1-8. **Tabulated Data.**

a. *Identification and Instruction Plates.*

(1) The laser has one major identification plate (fig 1-1) located on its left side. The plate contains official nomenclature, serial number, month and year of manufacture, manufacture code identification, procuring agency code identification, and part number. Two blank spaces are provided for any additional data.

(2) The ADFT has one major identification plate (fig 1-1) located on the top of the deflector optical assembly. It contains identical information described in paragraph above.

(3) There is one instruction plate and four identification markers on the laser. The location (A) and informational content (B) of these plates are shown in figure 1-2.

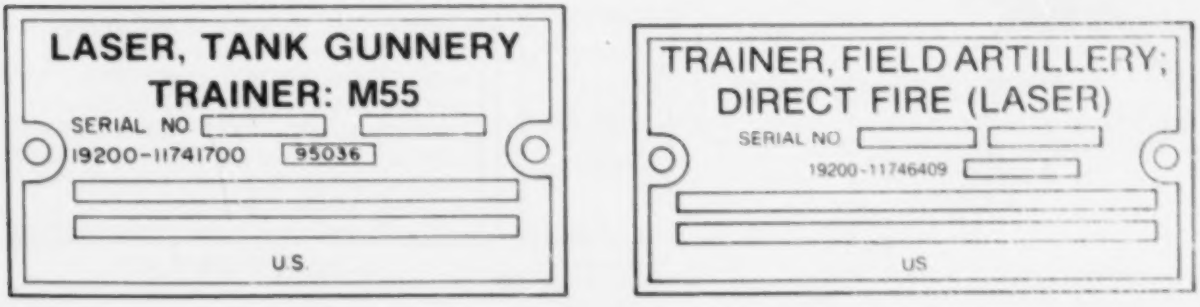
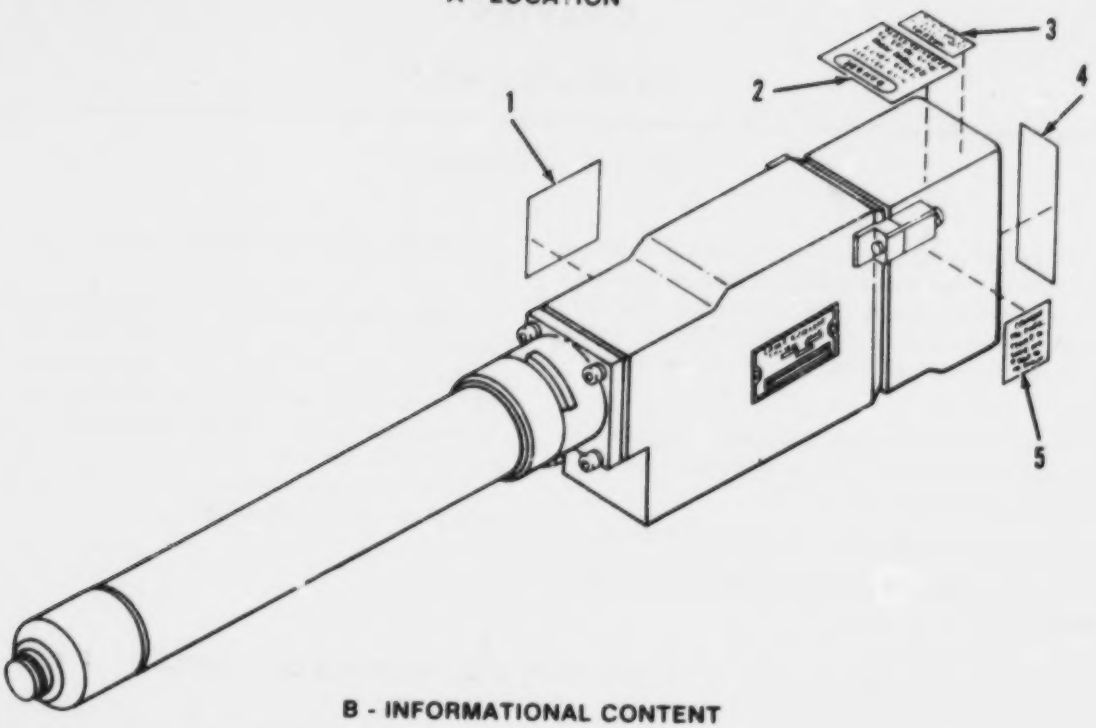


Figure 1-1. Identification plates

A - LOCATION



B - INFORMATIONAL CONTENT

CAUTION

He - Ne LASER

DO NOT STARE

DIRECTLY INTO BEAM

1 - IDENTIFICATION MARKER*

DANGER
HIGH VOLTAGE
10,000 VOLTS
REMOVE INPUT
PLUG PRIOR TO
REMOVING BARREL

2 - IDENTIFICATION MARKER*

WARNING

ALLOW 10 SECONDS
FOR HIGH VOLTAGE
TO DISCHARGE

3 - IDENTIFICATION MARKER*

FIRE
LASER
SAFE
FLASH
MODE
CONT
TRIGGER ON
LASER ON

4 - IDENTIFICATION MARKER*

CAUTION

THIS ELECTRONIC PRODUCT HAS BEEN EXEMPTED FROM FDA RADIATION SAFETY PERFORMANCE STANDARDS PRESCRIBED IN THE CODE OF FEDERAL REGULATION, TITLE 21, CHAPTER 1, SUB-CHAPTER J, PERSUANT TO EXEMPTION NO. 76EL-01DOD ISSUED ON 26 JULY 1976. THIS PRODUCT SHOULD NOT BE USED WITHOUT ADEQUATE PROTECTIVE DEVICES OR PROCEDURES.

5 - INSTRUCTION PLATE*

*Approximately 2/3 actual size.

AR 911802

Figure 1-2. Instruction plate and identification markers

Legend for Fig 1-2.

1. Identification marker - 11741698
2. Identification marker - 11741691
3. Identification marker - 11741693
4. Identification marker - 11741690
5. Instruction plate - 10556212

b. *Operating Characteristics.* Operating characteristics are listed below.

Power Supply	
Input voltage	+24 ± 6 volts dc
Output voltage (no load)	+9 ± 1 kilovolts dc
Output current (full load)	6 ± 0.3 milliamperes
Plasma Tube	
Type	Cold cathode - He Ne, internal mirrors
Wavelength	632.8 nanometers
Power output	1 to 2 milliwatts
Beam alignment	Parallel to the longitudinal axis of the mounting cylinder within 2 milliradians
Beam diameter	1.4 millimeters, maximum, at face of tube
Beam divergence	1.2 milliradians, maximum, at the $1/e^2$ power points
Timing Module	
Trigger input	+24 ± 6 volts dc
Inhibit input	+135 ± 10 volts dc
Optical System	
Type	Simple two-element, four-power Galilean telescope
Lenses	Plano-concave and plano-convex
Focus	Fixed focus at 200 feet
Collimation	Reduces laser beam divergence to 0.3 milliradians

1-9. Spares, Repair Parts, Special Tools, Special Test, Maintenance and Diagnostic Equipment (TMDE) and Other Special Support Equipment.

a. *Special Tools and Equipment.* Table 1-1 contains the special tools and equipment required for organizational maintenance

b. *Spares and Repair Parts.* Spares and repair parts are listed and illustrated in appendix C of this manual.

Table 1-1. Special Tools and Equipment

Item Name	National Stock Number	Use
Nitrogen, technical (tank)	6830-00-782-2641	Purging and charging the barrel/deflector assembly
Purging kit, fire control, SC 4931-95-CL-J54	4931-00-065-1110	Purging and charging the barrel/deflector assembly

CHAPTER 2

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

2-1. **General.**

a. When a new or reconditioned laser and ADFT are first received by the using organization, it is the responsibility of the personnel in charge to determine whether the materiel is complete, and if it is in satisfactory condition to perform its assigned mission when placed in service. Refer to AR 55-38 for reporting for transportation discrepancies in shipments.

b. Make a record of all deficiencies found so that they may be either remedied by the using organization or referred to the direct support and general support maintenance personnel. Refer to AR 700-58 for the reporting of these deficiencies.

2-2. **Unpacking Equipment.**

NOTE

When unpacking the fiberboard cartons, observe normal handling precautions to avoid damaging the equipment.

a. *Laser.*

(1) Cut the sealing tape on top of the carton containing the laser and fold back the flaps.

(2) Remove the fiber board fillers from the carton.

(3) Grasp the handles on the carrying case and remove it from the carton.

b. *Gunnery Trainer M55 (Tank) Targets.*

(1) Cut the sealing tape on top of the carton containing the retroreflective targets and frame assemblies and fold back the four flaps.

(2) Remove the two cartons, one containing the retroreflective targets and the other the frame assemblies.

(3) Cut the sealing tape on the one-piece carton containing the retroreflective targets.

(4) Open the carton and remove the carrying case which contains the targets.

(5) Cut the sealing tape on the one-piece carton containing the frame assemblies.

(6) Open the carton and remove the frame assemblies.

(7) Cut the sealing tape from the packing material around the frame assemblies.

(8) Remove the cushioning material.

(9) Cut the filament tape holding the frame assemblies together and remove the fiberboard packing.

2-3. **Inspecting and Servicing Equipment.**

a. *General.* Perform the PMCS (Table 2-1).

b. *Carrying Case (Laser).*

(1) Check the carrying case for dents, cracks, and any other visible damage.

(2) Check the handles for damage.

(3) Check the valve on the case for damage.

(4) Check the latches for damage.

(5) After opening the case, check its contents for completeness record any deficiencies.

c. *Laser.*

(1) Check the housing for dents, cracks, scratches, or any other visible damage.

(2) Check for broken or loose lamps and switches.

(3) Check the cell assembly for cracks, scratches, or marred surfaces.

(4) Check the power receptacle for loose mounting, bent or missing pins, or a damaged shell.

(5) Check that the barrel extension is not bent or marred in any way.

d. *Gunnery Trainer M55 (Tank) Targets.*

(1) Check that the canvas bag is not torn or damaged in any way.

(2) After opening the bag, check its contents and record any deficiencies.

(3) Check that the targets are not bent or corroded.

(4) Check the targets for scratched or marred surfaces.

(5) Check that the assemblies are not broken, bent, or in any way deformed.

(6) Check the assemblies for corrosion.

e. *ADFT.*

(1) Carrying case.

(a) Check the carrying case for cracks, breaks, and any other visible damage.

(b) Check the handles for damage.

(c) Check the valve on case for damage.

(d) Check the latches for damage.

(e) Check the three hinges for damage.

(f) After opening the case, check its contents for completeness. Record any deficiencies.

(2) Deflector optical assembly.

(a) Check frame, housing and shafts for cracks, breaks, bent shafts, or any other visible damage.

(b) Check for broken or loose switches or wires.

(3) Mount assembly.

(a) Check that all components are present and not bent or visibly damaged.

(b) Check for damaged or misaligned level vial.

(4) Distribution box and cables.

(a) Check all electrical connectors and receptacles for loose mounting, bent or missing pins, damaged shells, and loose or missing screws.

(b) Check for broken or loose wires.

(5) Targets.

(a) Check that all targets are not bent.

(b) Check targets for scratched or marred surfaces.

(6) Shipping container.

(a) Check wooden box for cracks, breaks, and any other visible damage.

(b) Check the handles and latches for damage.

(c) After opening the container, check its contents for completeness. Record any deficiencies.

(7) Support assembly.

(a) Check that the frames are not broken, bent, or in any way deformed, or any fastening hardware is missing.

(b) Check that target assembly is not bent.

(8) Base assembly.

(a) Check for any visible damage.

(b) Check for completeness of components.

(9) Target board.

(a) Check that target board is free of dents.

(b) Check the surface for scratches that reduce readability.

(c) Check optical assembly for cracks, scratches, or marred surfaces.

(d) Check all electrical connectors and receptacles for loose mounting, bent or missing pins, and damaged shells.

(e) Check for damaged level vials.

Section II. LUBRICATION INSTRUCTIONS

2-4. Only three areas in the trainer require lubrication; the heat sink assembly and the underside of the bracket (both within the electronics enclosure) and any preformed packings (O-rings) that have been replaced. Lubrication instructions are given in chapter 4.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS).

2-5. **PMCS Procedures (Table 2-1).**

a. *Item Number Column.* Checks and services are numbered in chronological order regardless of interval. This column shall be used as a source of item numbers for the "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

b. *Interval Columns.* The columns headed "W", "M", "Q", and "S" contain a dot (•) opposite the appropriate check. Thus, if a given check is performed weekly, a dot is placed opposite the checks in the "W" column; if the check is accomplished monthly, the dot is placed in the column headed "M", and if the same check is made in two or more periods, a dot is placed in each applicable column.

c. *Item to be Inspected Column.* The items in this column are divided into groups indicating the portion of equipment of which they are part. The item to be inspected is identified by as few words, usually the common name, as will clearly identify the item.

d. *Procedures Column.* This column contains a brief description of the procedure by which the check is to be performed. It contains all the information required to accomplish the checks and services including appropriate tolerances, adjustment limits, and instrument and gage readings.

Table 2-1. Organizational Preventive Maintenance Checks and Services

W - Weekly M - Monthly Q - Quarterly S - Semiannually

Item No.	Interval W	Interval M	Interval Q	Interval S	Item to be Inspected	Procedure	Equipment Will Be Reported Not Ready/ Available if:
1	•				Laser	Operational checkout. Ref TM 9-6920-357-10-1	NOT APPLICABLE (NA);
2	•				ADFT	Operational checkout. Ref TM 9-6920-357-10-2	NA
3		•			Publications	Check that all manuals are present, legible, and properly stowed in respective carrying case.	NA
4			•		Deflector Optical Assembly	Purging ref para 2-10.	NA

W - Weekly
M - Monthly
Q - Quarterly
S - Semiannually

Item No.	Interval W	Interval M	Interval Q	Interval S	Item to be Inspected	Procedure	Equipment Will Be Reported Not Ready Available if:
5			•		Barrel Assembly	Laser must be purged and charged quarterly, or whenever the plasma tube, cell assembly, or purging valve stem have been removed. Ref para 2-9.	NA
6				•	Identification Plates	Check to see that all name, warning, and instruction plates on the laser, ADFT, and carrying cases are present, legible, and properly secured. Ref fig 1-1 and fig 1-2.	NA

Section IV. TROUBLESHOOTING

2-6. Troubleshooting Procedures (Table 2-2).

a. This section contains the troubleshooting information for locating and correcting most of the operating troubles which may develop in the laser. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help to determine the corrective actions required. Perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all possible malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, notify direct support maintenance.

WARNING

Extremely dangerous potentials between 1,200 and 10,000 volts exist in the electronics assembly.

Table 2-2. Troubleshooting

MALFUNCTION Test or inspection	Corrective action

LASER

NOTE

The laser must go through a 30-second and possibly up to 30 minute warmup period before troubleshooting.

1. LASER DOES NOT FIRE AND TRIGGER ON AND LASER ON LAMPS DO NOT ILLUMINATE WHEN THE LASER SAFE FIRE CIRCUIT BREAKER SWITCH IS SET TO FIRE AND THE TRIGGER IS PRESSED.

NOTE

See figure 2-1 for block diagram of Laser and figure 2-2 for schematic of Laser.

Disconnect the firing cable from connector 1J1; press the trigger and check for +24 vdc at the firing cable.

a. If +24 vdc is not present, verify that the +24 vdc power supply source is operational.

b. If +24 vdc is present, notify direct support maintenance for repair of the laser.

2. LASER FIRES BUT TRIGGER ON LAMP DOES NOT ILLUMINATE.

Remove light lens from TRIGGER ON lamp.

a. Replace incandescent lamp.

b. Fire laser and note if replaced incandescent lamp illuminates. If not, notify direct support maintenance.

3. LASER FIRES BUT LASER ON LAMP DOES NOT ILLUMINATE.

Remove light lens from LASER ON lamp.

a. Replace glow lamp.

b. Fire laser and note if replaced glow lamp illuminates. If not, notify direct support maintenance.

4. LASER FIRES IRREGULARLY SHAPED OR DEFOCUSED BEAM OF LIGHT ONTO THE TARGET.

Step 1. Check for moisture in the barrel assembly.

a. If moisture is present, purge and charge.

b. If moisture remains, notify direct support maintenance.

Step 2. Check for foreign material on cell assembly.

a. If foreign material is present, clean lens with ethyl alcohol, lens paper (items 3 and 7, app D), or a camels hair brush (ref TM9-6920-357-10-2).

b. If foreign material remains, notify direct support maintenance.

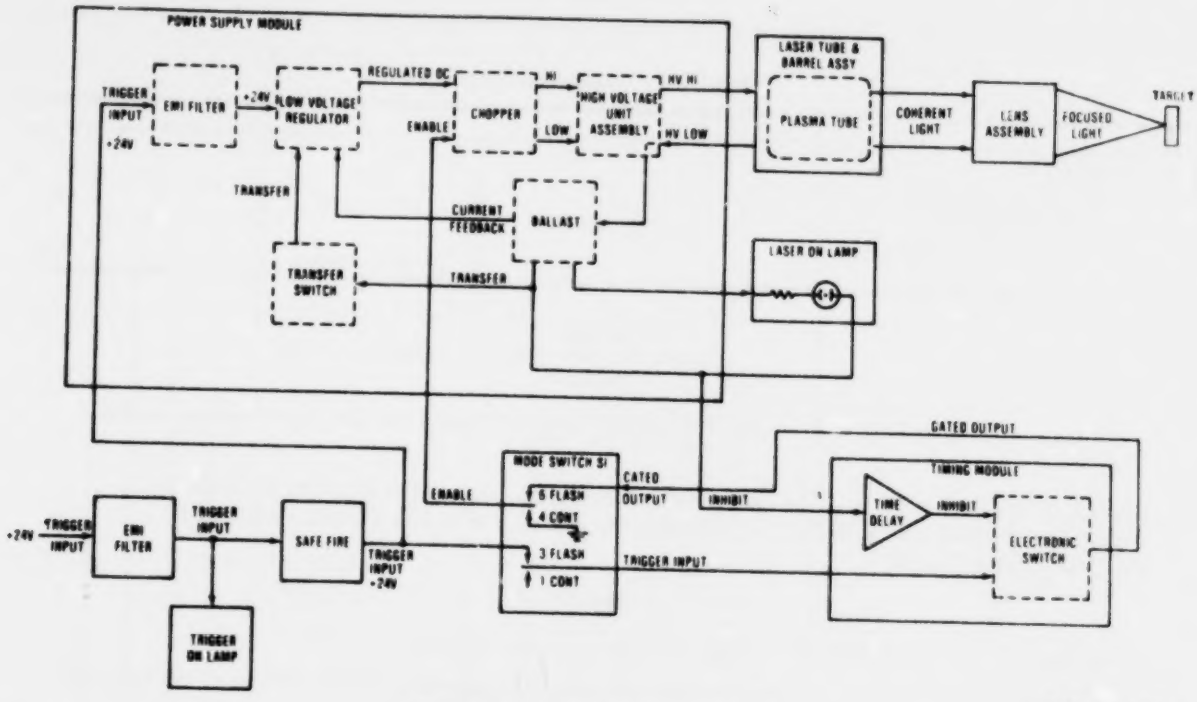


Figure 2-1. Block diagram of laser

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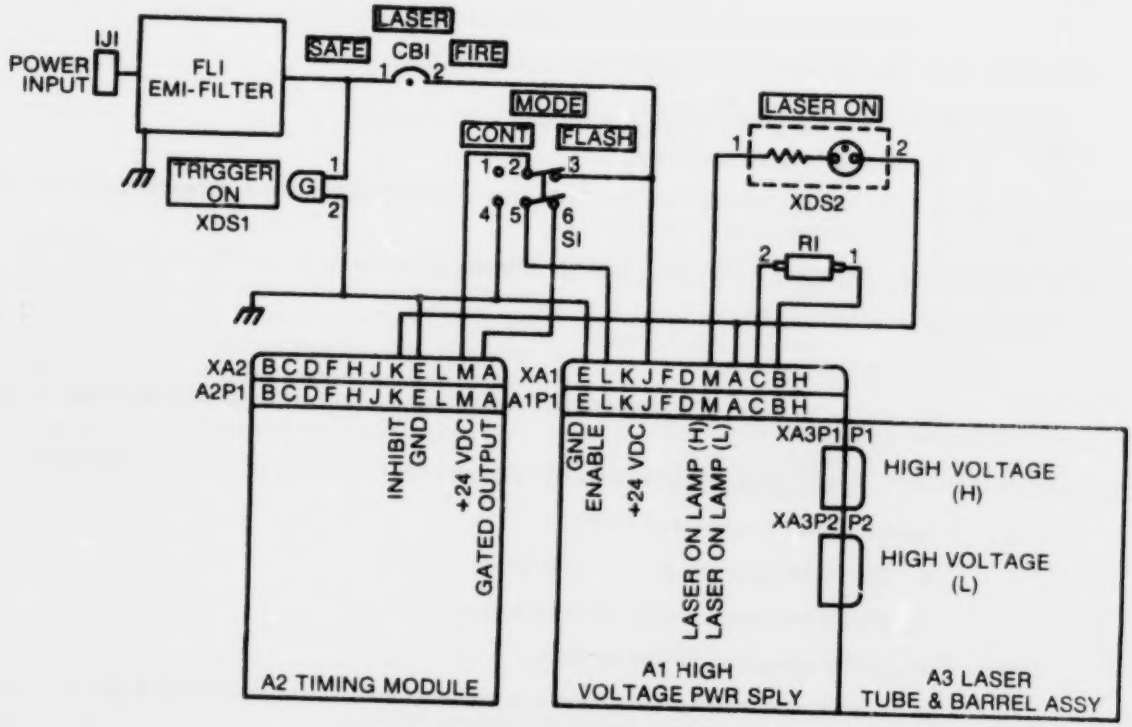


Figure 2-2. Schematic of laser

AR 920834

Section V. ELECTROMAGNETIC COMPATIBILITY

2-7. **Electromagnetic Compatibility.** The laser meets all the electromagnetic interference (EMI) emission requirements in accordance with MIL-STD-461A. It meets the voltage transient limits as specified in MIL-STD-1275.

Section VI. MAINTENANCE OF BARREL ASSEMBLY

2-8. **Description.** The barrel assembly (fig 2-3) consists of the protective dust cap (1), lens guard (2), cell assembly (3), purging valve stem (4),machine screw (sealing) (5), plasma laser tube (6), gun laser barrel (7), and other associated parts. The barrel assembly is provided with a mounting ring for installing the trainer on the coax gun mount or on the applicable howitzer. The barrel assembly is secured to the electronics enclosure with four internal bolts (1, fig 3-3). A dust cap (1, fig 2-3) which protects the optics from dust and dirt, is placed on the front of the barrel assembly when the trainer is not in use. The lens guard (2) provides a protective cover for the cell assembly (3), purging valve stem (4), and the machine screw (sealing) (5).

2-9. **Purging and Charging the Barrel Assembly.**

a. *General.* Purging and charging of the barrel assembly has to be performed after a plasma laser tube (6), cell assembly (3), or a purging valve stem (4) is installed, or during the quarterly preventive maintenance checks and services.

b. *Purging and Charging the Barrel Assembly.* Refer to figure 2-3 and proceed as follows:

NOTE

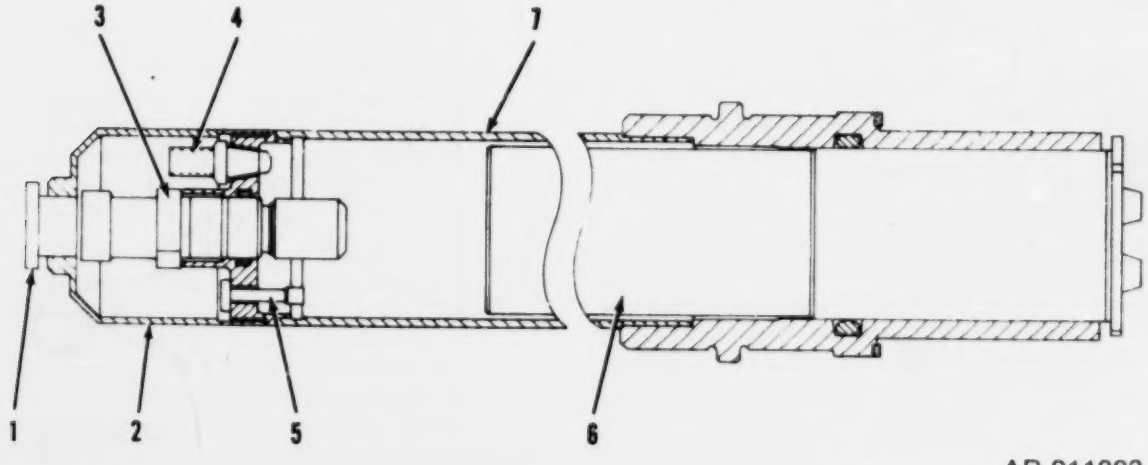
The barrel extension is mounted to the laser when it is used with the M551 and M551A1 assault vehicles. If the laser has the barrel extension already mounted to it, perform step 1; if not, proceed to step 2.

(1) Remove the barrel extension by turning it counterclockwise.

(2) Remove the lens guard (2) by turning it counterclockwise.

(3) Loosen the machine screw (sealing) (5).

(4) Attach the purging equipment to purging valve stem (4).



Legend for fig 2-3.

1. Protective dust cap - MS25178-10
2. Lens guard - 11741679
3. Cell assembly - 11741680
4. Purging valve stem - MS51607-1
5. Machine screw (sealing) - 11737718
6. Plasma laser tube - 11746797
7. Gun laser barrel - 11741676

Figure 2-3. Barrel assembly

(5) Purge the barrel assembly at 5 psi for two minutes in accordance with the procedure provided in TM 750-116, Section 3.

(6) Tighten the machine screw (sealing) (5) before charging the barrel assembly.

(7) Charge the barrel assembly with nitrogen to 1 psi.

(8) Remove the purging equipment.

(9) Install the lens guard (2) by turning it clockwise.

NOTE

If the laser is to be installed onthe M551 or M551A1 assault vehicle, perform step 10.

(10) Install the barrel extension by turning it clockwise.

2-10. **Purging Deflector Optical Assembly.**

a. Remove machine screws from the deflector optical assembly (fig 2-4).

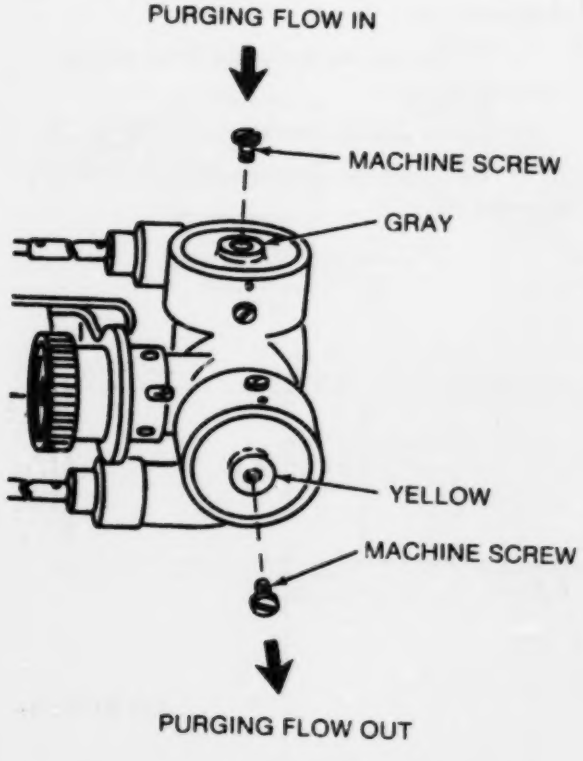


Figure 2-4. Removal/installation of machine screws for purging deflector optical assembly

b. Purge the deflector optical assembly for two minutes (TM 750-116).

c. Install machine screws.

2-11. **Repair of Electronic Components.**

a. *General.* The only repair of the electronic components is the replacement of the glow lamp and the incandescent lamp.

b. *Removal.*

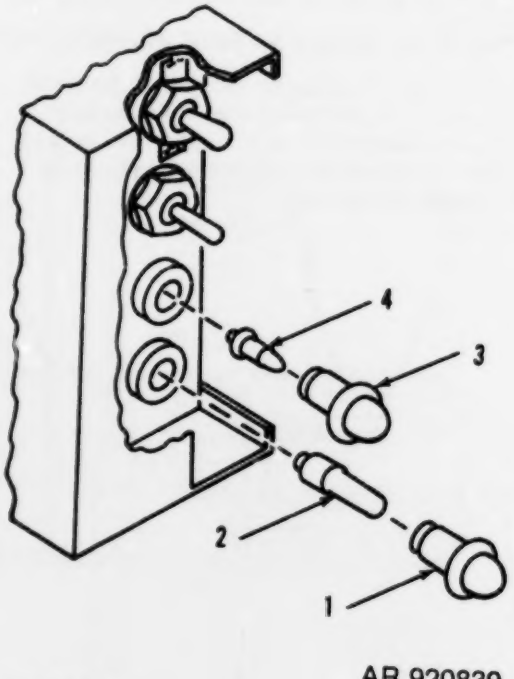
(1) Remove light lens (1, fig 2-5) and remove glow lamp (2).

(2) Remove light lens (3) and remove incandescent lamp (4).

c. *Installation.*

(1) Install incandescent lamp (4) and install light lens (3).

(2) Install glow lamp (2) and install light lens (1).



Legend for fig 2-5.

1. Light lens - 11737708-3
2. Glow lamp - MS25252-C7A
3. Light lens - 11737708-2
4. Incandescent lamp - MS18209-387

Figure 2-5. Removal and installation of electronic components

CHAPTER 3

DIRECT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. PREEMBARKATION INSPECTION OF MATERIEL IN UNITS ALERTED FOR OVERSEAS MOVEMENT

3-1. **General.** This inspection is conducted on materiel in alerted units scheduled for overseas duty to ensure that such materiel will not become unserviceable in a relatively short time. The inspection prescribes a higher percentage of remaining usable life in serviceable materiel to meet a specific need beyond minimum serviceability.

3-2. **Inspection Points.**

a. Screw heads must be in serviceable condition and threads must not be stripped.

b. Materiel must be free of burrs, particularly those on functional surfaces.

c. Parts must not be cracked, bent, distorted, or damaged, and must be free of detrimental wear.

d. Painted surfaces must be free of bare spots.

e. Operating controls must function smoothly.

f. Identification plate must be present and secure.

g. Inspect electrical components for improper functioning, physical damage, and missing parts.

h. Inspect optical parts for cracks, scratches, and moisture on inside of optical cell.

i. Inspect targets and reflective surfaces for scratches and damage prior to insertion in case.

j. Be sure individual targets are between dividers of carrying case to protect target surfaces while in transit prior to packaging of ADFT.

Section II. TROUBLESHOOTING

3-3. **General.**

CAUTION

Operation of laser without a preliminary examination can cause further damage to components. Be careful during inspection and troubleshooting so that damage can be avoided.

a. This section contains the troubleshooting information for locating and correcting most of the operating troubles which may develop in the laser. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine the corrective actions for you to take. You should perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all possible malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed (except when malfunction and cause are obvious), or is not corrected by listed corrective actions, notify your supervisor.

c. This section covers troubleshooting which is peculiar to direct and general support maintenance operations only. For troubleshooting procedures for organizational maintenance, refer to chapter 2.

d. Direct and general support troubleshooting will enable the appropriate maintenance personnel to determine if a module or assembly is defective. The troubleshooting procedure provided in table 3-1 is one of determining the occurrence of malfunctions, performing a fault isolation procedure, determining the probable cause, and then taking the necessary corrective action, which includes notifying maintenance personnel if the corrective action and remedies are beyond the scope of direct and general support level of maintenance.

WARNING

Extremely dangerous potentials between 1200 and 10,000 volts exist in the electronics assembly.

3-4. **Troubleshooting Procedures.** Refer to table 3-1.

NOTE

See figure 2-1 for block diagram of laser and figure 2-2 for schematic of laser.

Table 3-1. Troubleshooting

MALFUNCTION Test or inspection Corrective action
LASER
NOTE The laser requires a 30-second and possibly up to 30 minutes warmup period before troubleshooting.
1. LASER DOESN'T FIRE. TRIGGER ON AND LASER ON LAMPS DO NOT ILLUMINATE WHEN THE LASER SAFE FIRE CIRCUIT BREAKER SWITCH IS SET TO FIRE AND +24 VDC IS APPLIED TO THE TRAINER.
Open the rear cover of the electronics assembly and use a voltohmmeter (vom) to check for +24 ± 6 vdc between pin 1 on the LASER SAFE FIRE circuit breaker switch and ground. See figure 3-1.
Notify depot maintenance for replacement of EMI filter FL1.
2. LASER DOES NOT FIRE IN THE CONTINUOUS MODE. TRIGGER ON LAMP ILLUMINATES, AND LASER ON LAMP AND GLOW LAMP ON THE POWER SUPPLY ARE EXTINGUISHED, WHEN THE LASER SAFE FIRE CIRCUIT BREAKER SWITCH IS SET TO FIRE AND +24 VDC IS APPLIED TO THE LASER.
Step 1. With a vom, check for +24 ± 6 vdc between pin 2 on the LASER SAFE FIRE circuit breaker switch and ground. See figure 3-1.
If +24 ± 6 vdc is not obtained, replace the LASER SAFE FIRE circuit breaker switch. Refer to paragraphs 4-5c and d. If +24 ± 6 vdc is obtained, proceed to step 2.

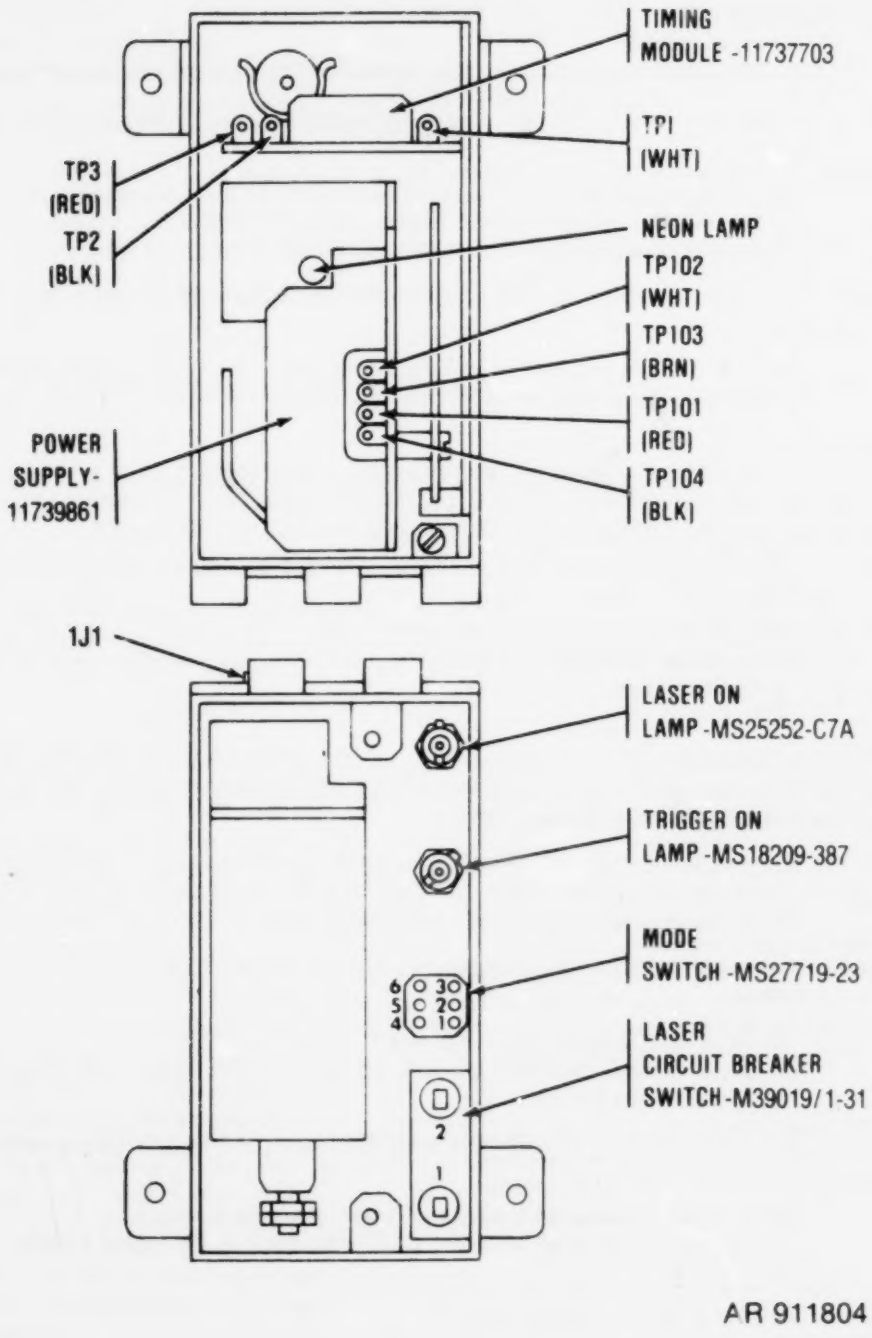


Figure 3-1. Electronic components - rear view - cover open

Table 3-1. Troubleshooting - Continued

MALFUNCTION Test or inspection Corrective action

Step 2. With a vom, check for +24 ± 6 vdc between TP102 (white) and TP104 (black) (fig 3-1) on the power supply.

If +24 + 6 vdc is obtained, pin 4 of the MODE CONT FLASH switch may not be properly grounded or the switch is possibly defective. Replace the MODE CONT FLASH switch if defective. Refer to paragraphs 4-5e and f. If +24 ± 6 vdc is not obtained, proceed to step 3.

Step 3. With a vom, check for +9 ± 2 vdc between TP103 (brown) and TP104 (black) (fig 3-1) on the power supply.

If the +9 + 2 vdc is obtained, replace the plasma tube. If the voltage measured is less than +7 vdc, replace the power supply module. Refer to paragraphs 4-6b and c.

3. LASER DOES NOT FIRE IN THE CONTINUOUS MODE. TRIGGER ON LAMP, LASER ON LAMP, AND NEON LAMP ON THE POWER SUPPLY ILLUMINATE WHEN THE LASER SAFE FIRE CIRCUIT BREAKER SWITCH IS SET TO FIRE AND +24 VDC IS APPLIED TO THE LASER.

With a vom, check for +9 ± 2 vdc between TP103 (brown) and TP104 (black)(fig 3-1) on the power supply.

If +9 ± 2 vdc is obtained, replace the plasma tube.
If the voltage measured is less than +7 vdc, replace the power supply module. Refer to paragraphs 4-6b and c.

4. LASER DOES NOT FLASH IN THE FLASH MODE. TRIGGER ON LAMP ILLUMINATES, AND LASER ON LAMP DOES NOT FLASH WHEN THE LASER SAFE FIRE CIRCUIT BREAKER SWITCH IS SET TO FIRE AND +24 VDC IS APPLIED TO THE LASER.

Step 1. Set the MODE CONT FLASH switch to CONT and press the trigger and observe if the laser fires.
If the laser fires, set the MODE CONT FLASH switch to FLASH and proceed to step 2.
If the laser does not fire, perform paragraph 2 above.

Step 2. With a vom, check for +24 ± 6 vdc between TP1 (white) and TP2 (black) (fig 3-1) on the timing module.

If +24 ± 6 vdc is obtained, proceed to step 3.
If +24 ± 6 vdc is not obtained, replace the MODE CONT FLASH switch. Refer to paragraphs 4-5e and f.

Step 3. With a vom, check between TP3 (red) and TP2 (black) (fig 3-1) on the timing module for 1 vdc, maximum.

If the voltage measured is less than 1 vdc, proceed to step 4.
If the voltage measured is larger than 1 vdc, replace the timing module. Refer to paragraphs 4-7b and c.

Table 3-1. Troubleshooting - Continued

MALFUNCTION Test or inspection Corrective action
Step 4. With a vom, check between TP101 (red) and TP104 (black) (fig 3-1) on the power supply for 1 vdc, maximum. If the voltage measured is less than 1 vdc, replace power supply module. Refer to paragraphs 4-6b and c.
5. LASER FIRES IRREGULARLY SHAPED OR DEFOCUSED BEAM OF LIGHT ONTO THE TARGET. Check for a cracked lens in the cell assembly. a. If lens is cracked, replace cell assembly. b. If lens is not cracked, replace plasma tube.

Section III. GENERAL MAINTENANCE

3-5. **Cleaning.**

a. *General.* Any special cleaning instructions required for a specific mechanism or part are contained in the pertinent section.

WARNING

Dry cleaning solvent is flammable and should not be used near an open flame Fire extinguishers should be provided. Use flammable material only in well-ventilated places.

Trichloroethane is toxic. Avoid exposure to skin or breathing fumes.

CAUTION

Dry cleaning solvent evaporates quickly and has a drying effect on the skin. Using gloves may prevent cracks in the skin and a mild irritation or inflammation.

Avoid getting petroleum products, such as dry cleaning solvent, engine fuels, or lubricants on O-rings and RFI gaskets because they will deteriorate the rubber. The use of diesel fuel oil, gasoline carbontetrachloride, or benzyl (bensol) for cleaning is prohibited.

b. *Metal Surfaces.* Use a dry cleaning solvent (item 3, app D) to clean or wash grease or oil from all metal parts except electronic chassis.

c. *Electronics Assembly and Components.* Electronic chassis and components are cleaned using trichloroethane (item 10, app D). Care must be exercised to prevent damage to components and associated circuitry during the cleaning process. After cleaning, allow to air-dry.

CAUTION

Do not use trichloroethane for cleaning the power supply module. It may damage the encapsulated high voltage section of the module.

d. *Optical Surfaces of the Laser and ADFT.*

(1) To remove dust, lint, or other foreign matter from lenses, brush the glass lightly with a clean camelhair brush, and rap the brush against a hard body to knock out the small particles. Repeat this operation until all dust is removed.

(2) To remove oil or grease from optical surfaces when the temperature is above 32°F, apply alcohol (item 4, app D) with a swab and wipe off with clean lens paper (item 7, app D). Repeat this operation until clean.

(3) In cold weather, optical surfaces should be cleaned with lens paper (item 7, app D) moistened with alcohol (item 4, app D). If alcohol is not available, use dry lens paper. Alcohol should never be applied directly to the lens surfaces since excess may injure the sealing compound. Do not breathe on the glass since this would ice the surface.

(4) Moisture due to condensation may collect on the optical elements of the instruments when the temperature of the parts is lower than that of the surrounding air. This moisture, if not excessive, can be removed by placing the instruments in a warm place. Heat from strongly concentrated sources should not be applied directly since it may cause unequal expansion of parts resulting in damage to parts and inaccuracies of observation.

3-6. **Painting.** Maintenance personnel, when required, will perform both touch up and complete paint refinishing on the laser and applicable components of the ADFT. Care must be exercised when repainting the laser and ADFT components to prevent paint from covering scales, lenses, telescope seats, etc, in order to maintain these and like surfaces in efficient working condition. Refer to TM 43-0139 for painting instructions.

3-7. **Lubrication.** The heat sink assembly and bracket should be lubricated before installing the power supply module. In addition, the heat sink on the power supply module should be lubricated. All O-rings should be lubricated before installation.

a. *Heat Sinks - Enclosure Assembly (Fig 3-2).*

To lubricate the heat sinks, proceed as follows:

(1) Clean the area to be lubricated.

(2) Apply a light coat of heat sink compound (item 6, app D) to the four contact strips of the heat sink.

b. *Support Bracket - Enclosure Assembly (Fig 3-2).* To lubricate the underside of the support bracket, proceed as follows:

(1) Clean the area to be lubricated.

(2) Apply a light coat of heat sink compound (item 6, app D) to the underside of the bracket.

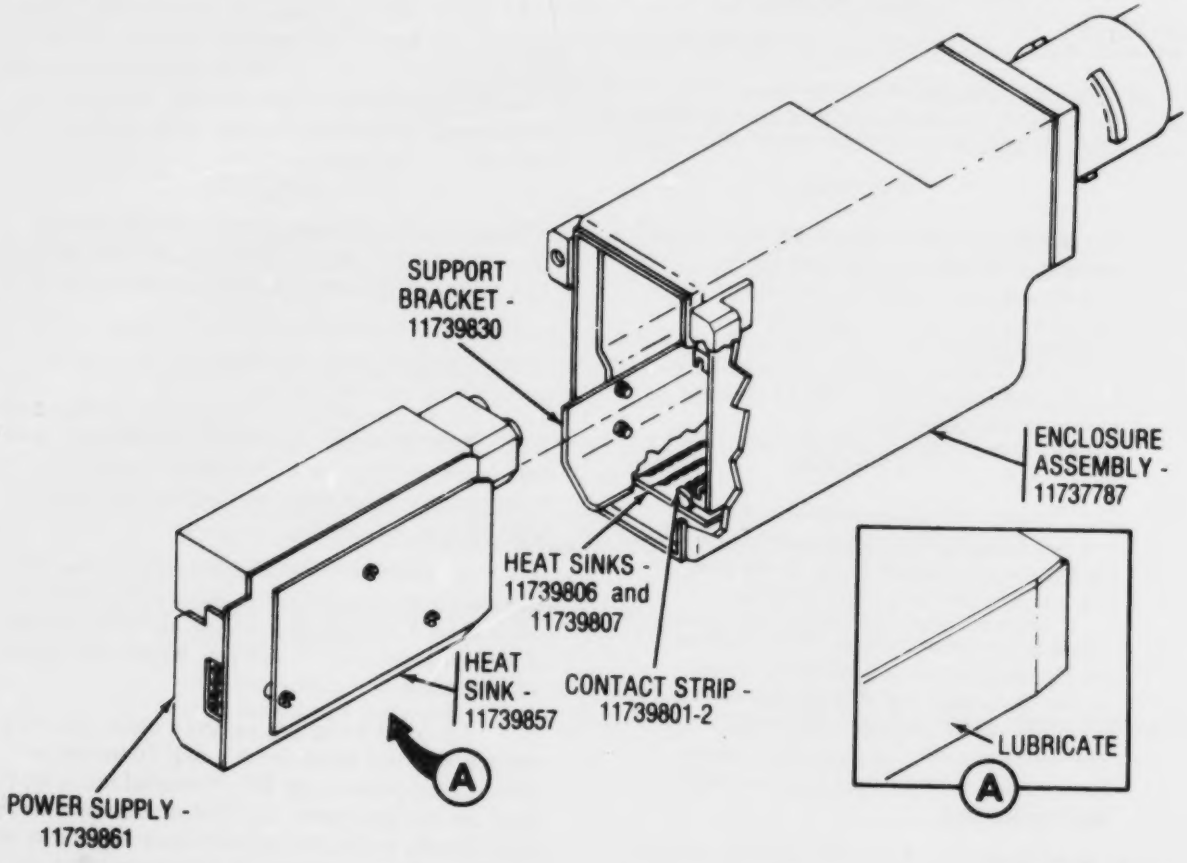


Figure 3-2. Lubrication - electronic components

c. *Heat Sink - Power Supply (Fig 3-2).*

(1) Clean the area to be lubricated.

(2) Apply a light coat of heat sink compound (item 6, app D) to the heat sink (see insert A), making sure it covers the entire area of the heat sink.

d. *O-Rings.* Any time an O-ring is replaced in the laser or ADFT, a light coat of grease (item 5, app D) should be applied.

Section IV. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS

3-8. **Laser.**

a. *Barrel Assembly.*

NOTE

If the barrel extension is mounted on the barrel assembly, remove the extension by rotating counterclockwise.

(1) Removal of barrel assembly.

(a) Loosen the four internal bolts and lock washers (1 and 2, fig 3-3) that secure the barrel assembly (3) to the electronic components (4).

(b) Separate the barrel assembly (3) from the electronic components (4).

NOTE

When the barrel assembly separates from the electronic components, make sure the shielding gasket (6) is retained by the internal bolts.

(2) Installation of barrel assembly.

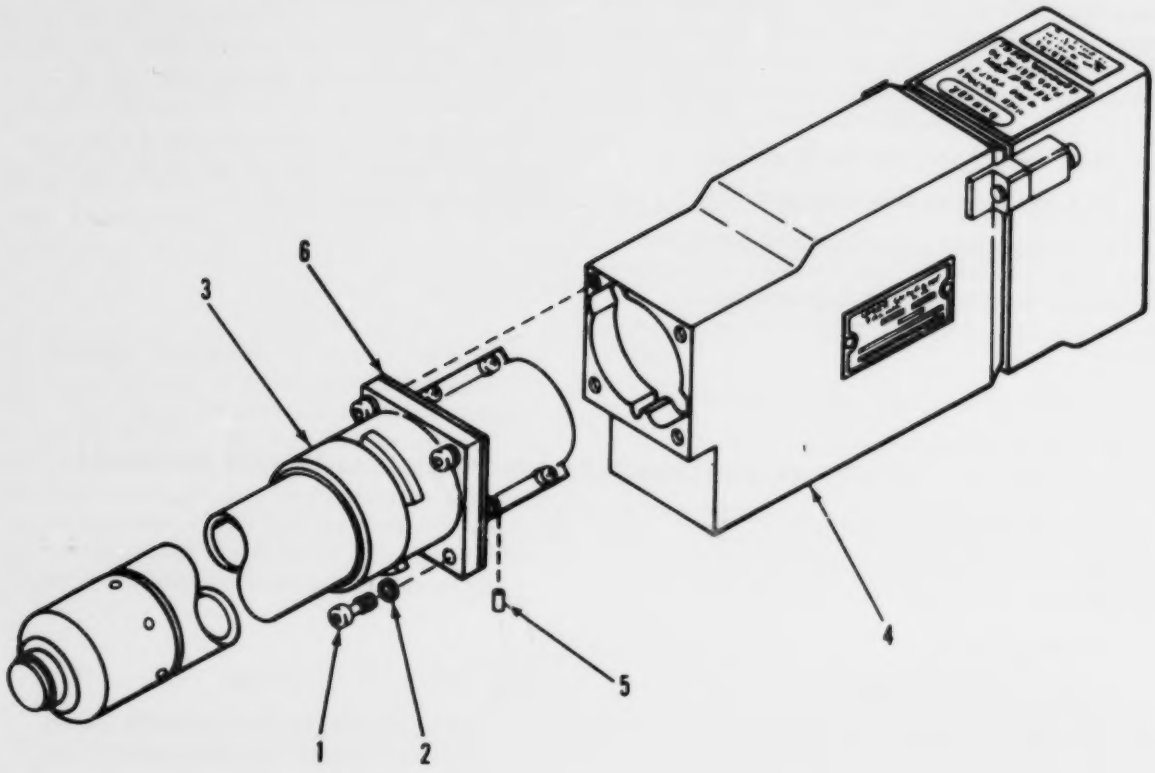
NOTE

Before installing the barrel assembly, inspect the shielding gasket and make sure it is not torn or defective.

(a) Position the barrel assembly (3) so its pin (5) is aligned with the keyway on the electronic components.

(b) Secure the barrel assembly to the electronic components by tightening the four internal bolts (1).

b. *Electronic components.* The procedures listed in paragraph 3-8a. Separate the two major assemblies that make up the laser. They are the barrel assembly (3) and the electronic components (4). After this procedure has been completed, each of the assemblies may be repaired.



Legend for fig 3-3.

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1. Internal bolt - 11737730
2. Lock washer - MS35338-138
3. Barrel assembly - 11741701
4. Electronic components - 11737724
5. Straight pin - 11737742
6. Shielding gasket - 11737729

Figure 3-3. Removal and installation of barrel assembly

3-9. **Field Artillery Direct Fire Trainer (ADFT).**

a. *Control Box Assembly.*

(1) Removal of control box assembly. Remove machine screws, lock washers, and loop clamps (2, 3, and 4, fig 3-4) that secure control box (1), electric plug connector (5) cable, and wire (6) to bracket (7).

NOTE

Before installing the control box assembly, inspect for frayed or broken wires, bent pins or connector, and cold or loose solder joints.

(2) Installation of control box assembly. Secure control box (1) to bracket (7) with machine screws (2), lock washers (3), and loop clamps (4). Electric plug connector (5) cable and wire (6) shall be held in position with loop clamp (4).

b. *Deflector Assembly.*

(1) Removal.

(a) Remove ring (8) and adapter (9).

(b) Remove pins (10), which connect deflector assembly (11) to universal joints (12).

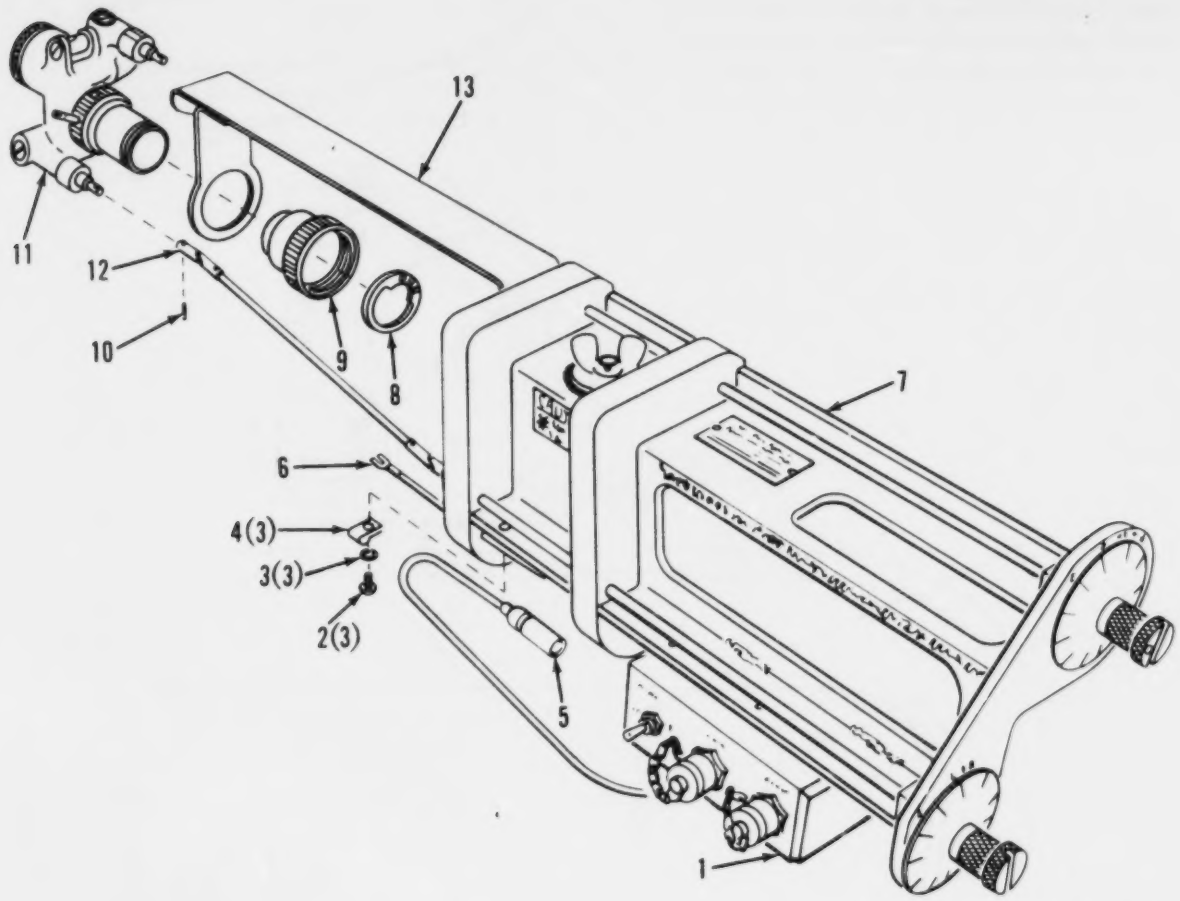
NOTE

Before pinning deflector assembly to shafts, inspect threads on adapter for broken or cracked housing.

(2) Installation.

(a) Install deflector assembly (11) to the deflector holder (13, fig 3-4) and install adapter (9) and ring (8).

(b) Align holes in deflector assembly (11) and universal joints (12), and then press fit pins (10) into holes to complete assembly.



Legend for fig 3-4.

1. Control box assembly - 11746456
2. Machine screw - MS51957-63
3. Lock washer - MS35338-138
4. Loop clamp - MS25281-R2
5. Electric plug connector - MS27144-2
6. Wire
7. Bracket - 11746411
8. Ring MS16626-4118
9. Adapter - 11746423
10. Pin - MS16555-604
11. Deflector assembly - 11746421
12. Universal joint - MS20270B6
13. Deflector holder - 11728997

Figure 3-4. Removal and installation of deflector optical assembly

c. *Mount Assembly.*

(1) Removal of mount. Remove socket head cap screw and lock washer (1 and 2, fig 3-5) that secure mount (3) to clamp (4).

(2) Installation of mount. Place mount (3) in position on clamp (4) and secure with socket head cap screw (1) and lock washer (2).

NOTE

Mount should always be positioned as shown in figure 3-5.

d. *Mount.*

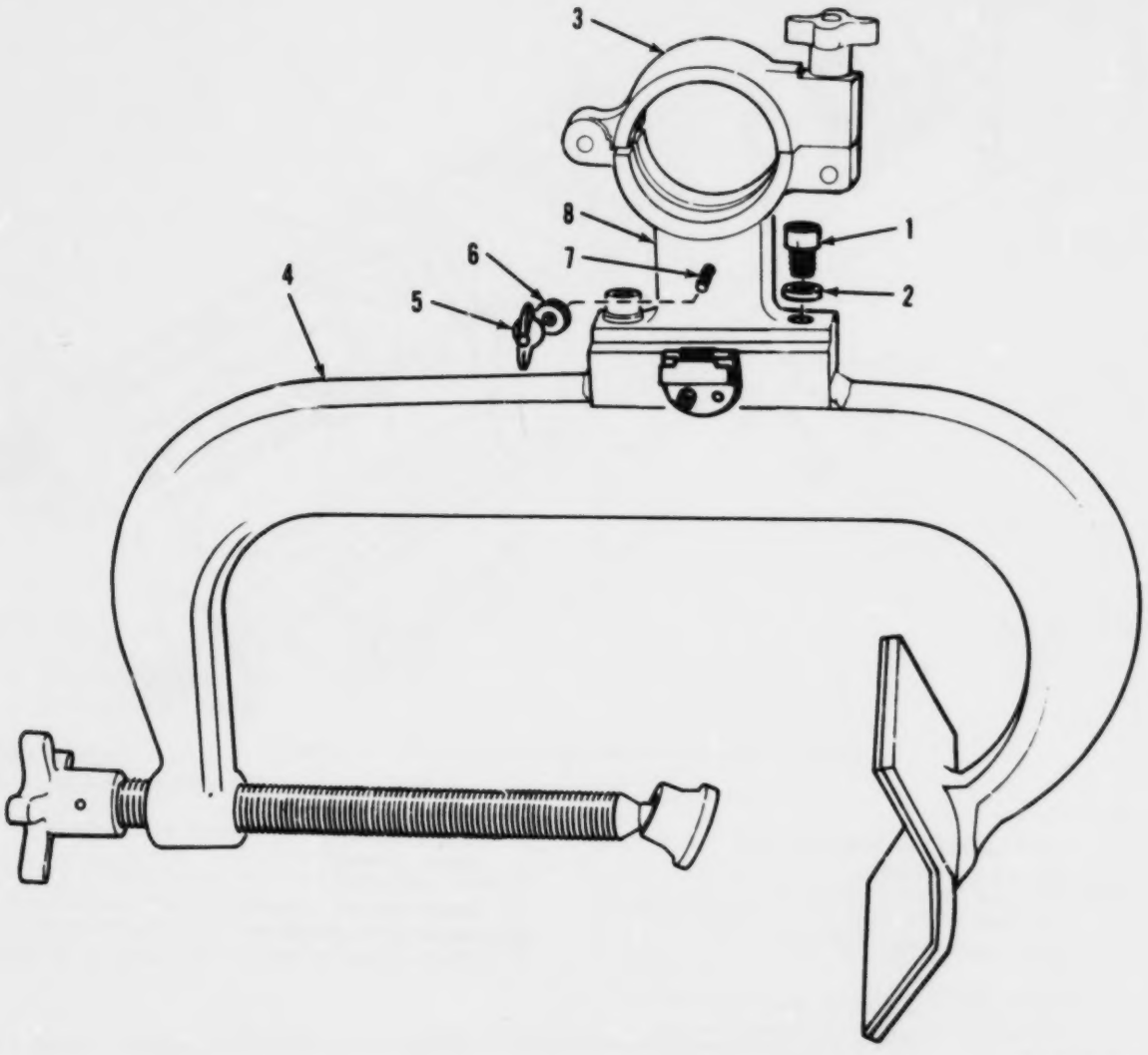
(1) Removal of mount components. Remove wing nut (5) by rotating it counterclockwise. Remove lock washer (6) and disengage setscrew (7) from base (8).

(2) Installation of mount components. Apply sealing compound (item 9, app D) to threads of setscrew (7) and install it clockwise into base (8). Place lock washer (6) on setscrew (7). Rotate wing nut (5) onto setscrew (7) until threads of setscrew protrude. Peen over the last thread of setscrew.

e. *Distribution Box.*

NOTE

The following removal and installation instructions are for all the electrical covers mounted on the distribution box.

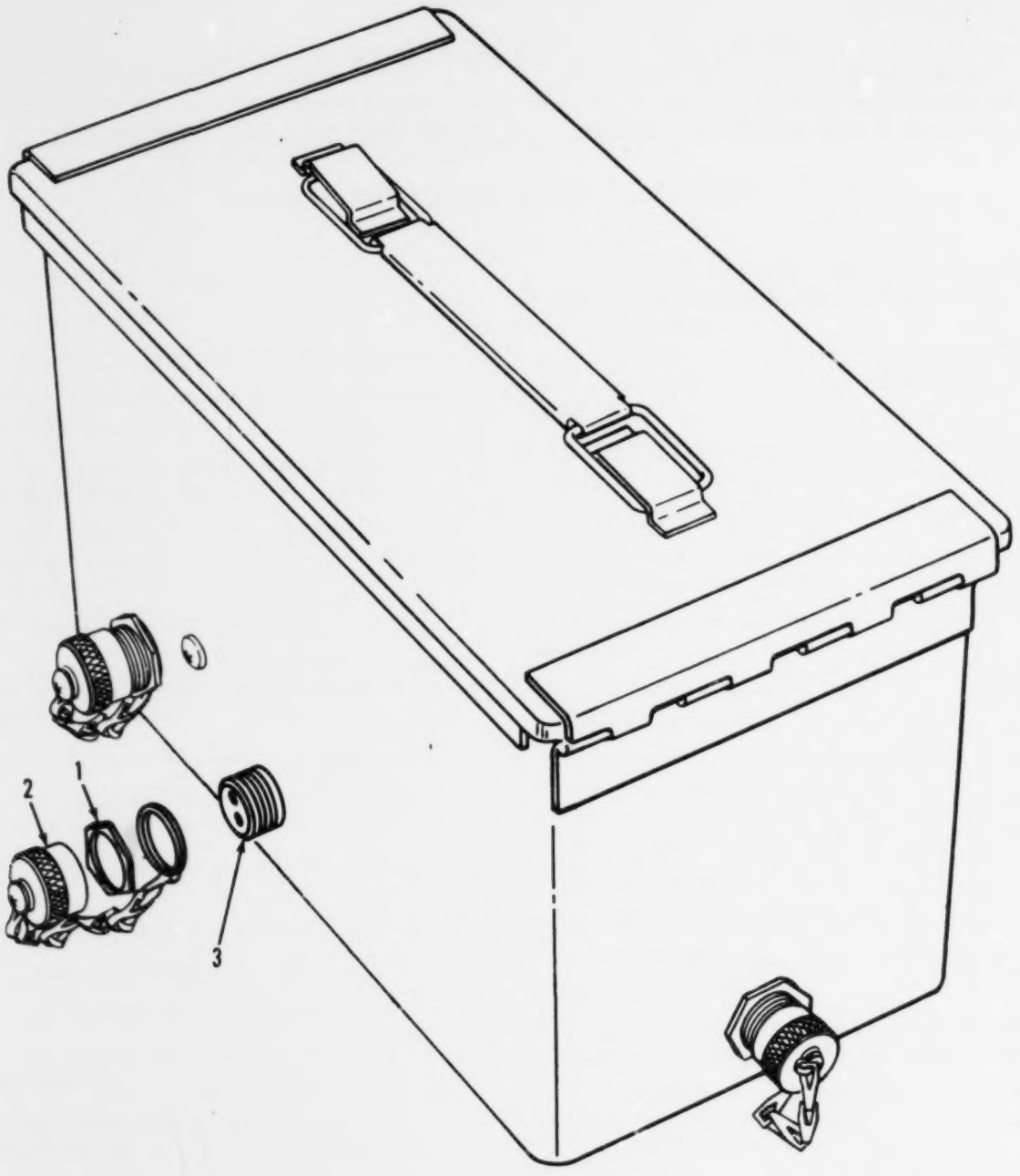


AR 911808

Legend for fig 3-5.

1. Socket head cap screw - MS16995-81
2. Lock washer - MS35338-141
3. Mount - 11746495
4. Clamp - 11746491
5. Wing nut - MS35425-37
6. Lock washer - MS35333-73
7. Setscrew - MS51021-49
8. Base - 11746497

Figure 3-5. Removal and installation of mount and mount components



Legend for fig 3-6.

1. Nut (part of Connector - MS3114E12-3S)
2. Electrical cover - MS3181-12N
3. Connector - MS3114E12-3S

Figure 3-6. Removal and installation of electrical covers

(1) Removal of electrical cover. Remove nut (1) and electrical cover (2) from connector (3). Slide ring chained to electrical cover (2) off the threads of the connector.

(2) Installation of electrical cover. Slide ring connected to electrical cover (2) onto thread of connector and secure with nut (1). Rotate electrical cover (2) clockwise onto threads of connector.

CHAPTER 4

REPAIR OF LASER GUNERY TRAINER

Section I. REPAIR OF BARREL ASSEMBLY

4-1. **Purging Valve Core and Stem.**

a. *Removal of Valve Core.*

(1) Remove protective dust cap (1, fig 4-1).

(2) Remove the lens guard (2) by rotating it counterclockwise.

(3) Loosen the machine screw (sealing) (3) on the barrel assembly to release the internal pressure.

(4) Rotate valve core (4) counterclockwise using the applicable valve tool. Remove the core from purging valve stem (5).

b. *Installation of Valve Core.*

(1) Insert the valve core (4) into the purging valve stem (5) and rotate it clockwise using the applicable valve tool until it is secure.

(2) Tighten the machine screw (sealing) (3).

(3) Purge and charge the barrel assembly in accordance with instructions given in paragraph 2-9.

(4) Install the lens guard (2) by rotating clockwise.

(5) Install protective dust cap (1).

c. *Removal of Purging Valve Stem.*

(1) Remove dust cap (1, fig 4-1).

(2) Remove lens guard (2) by rotating it counterclockwise.

(3) Loosen the machine screw (sealing) (3) on the barrel assembly to release the internal pressure.

(4) Rotate the purging valve stem (5) counterclockwise until it separates from barrel assembly.

d. *Installation of Purging Valve Stem.*

(1) Clean the threads and the area around the threaded opening in the barrel assembly of any residue.

(2) Apply a light coat of sealing compound (item 9, app D) to the threads on the tapered end of the purging valve stem (5).

(3) Insert the purging valve stem (5) into the barrel assembly and rotate it clockwise until it is secure.

(4) Remove any excess sealing compound that may form in the area around the purging valve stem (5).

(5) Tighten the machine screw (sealing) (3).

(6) Purge and charge the barrel assembly in accordance with instructions given in paragraph 2-9.

(7) Install the lens guard (2) by rotating it clockwise.

(8) Install dust cap (1).

4-2. **Optical Cell Assembly.**

a. *Description.* The optical cell assembly (6, fig 4-1) is a collimating optical system that focuses the laser beam to approximately 5/8 inch in diameter at 200 feet. The optical system consists of a simple two-element, four-power Galilean telescope and is shown functionally in figure 4-2.

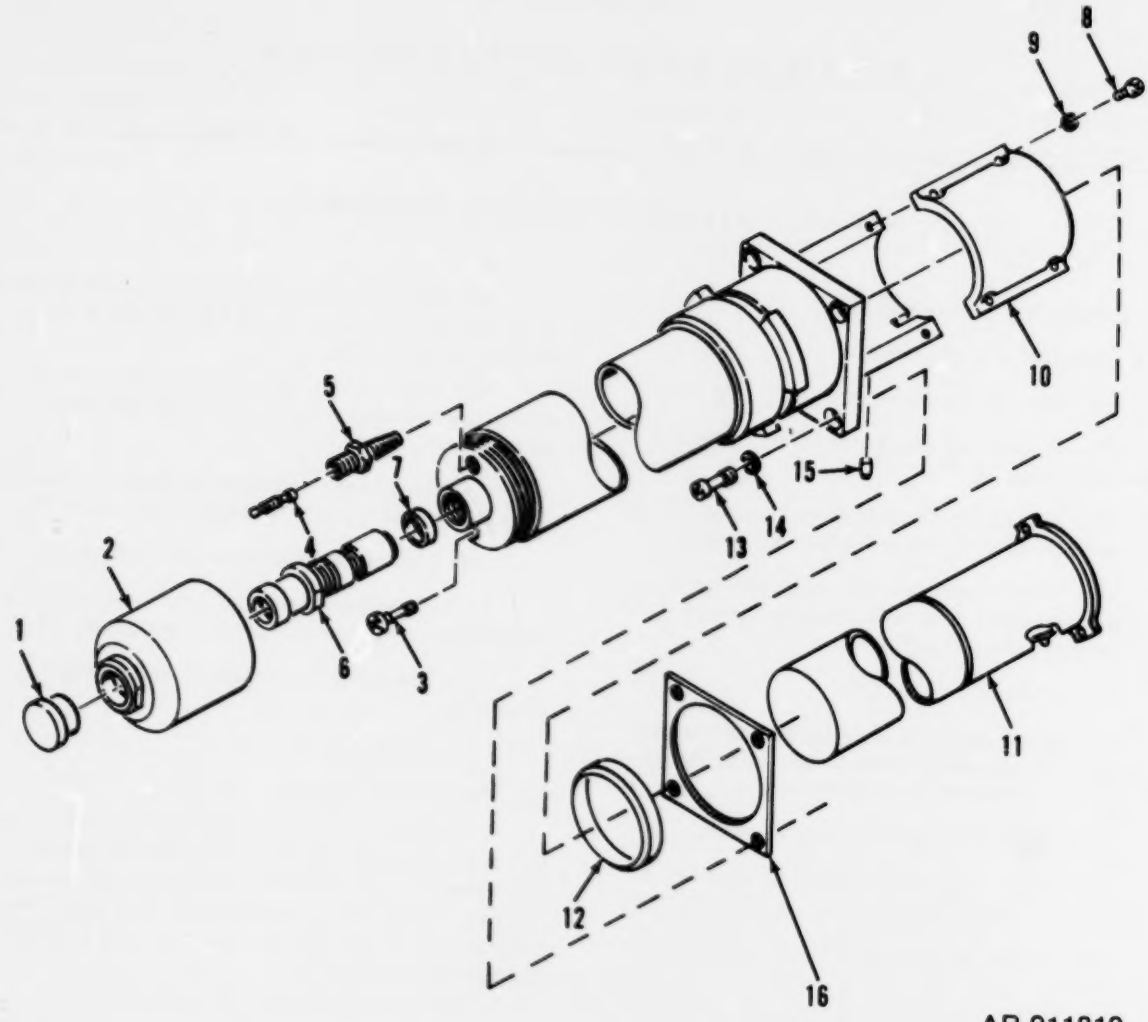
b. *Removal of Optical Cell Assembly.*

(1) Remove the lens guard (2, fig 4-1) by rotating it counterclockwise.

(2) Rotate the optical cell assembly (6) counterclockwise using the two flat surfaces on the assembly.

(3) When the threaded portion of the optical cell assembly (6) clears the barrel assembly, grasp the optical cell assembly (6) on the flat surfaces and slide it out.

c. *Service.* After removing the optical cell assembly, clean the threads, the O-ring (7), and the opening in the barrel assembly. Inspect the O-ring; if it is defective, replace it. Lubricate the O-ring (7) with a light coat of grease (item 5, app D). Before installing the optical cell assembly (6), make sure the surfaces of the lenses are clean.



Legend for fig 4-1.

1. Protective dust cap - MS25178-10
2. Lens guard - 11741679
3. Machine screw (sealing) - 11737718
4. Valve core - MS51377-2
5. Purging valve stem - MS51607-1
6. Optical cell assembly - 11741680
7. Preformed packing (O-ring) - MS9021-114
8. Socket head cap screw - MS16995-18
9. Lock washer - MS35338-136
10. Tube clamp - 11741677
11. Plasma laser tube - 11746797
12. Preformed packing (O-ring) - MS9021-327
13. Internal bolt - 11737730
14. Lock washer - MS35338-138
15. Straight pin - 11737742
16. Laser, plasma shielding gasket - 11737729

Figure 4-1. Barrel assembly

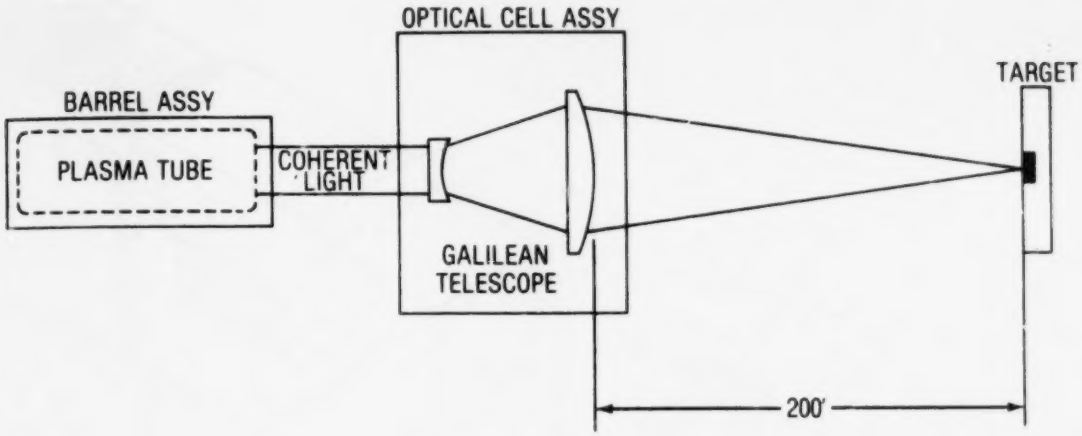


Figure 4-2. Optical cell assembly system

d. *Installation of Optical Cell Assembly.*

NOTE

Do not disassemble the optical cell assembly (6, fig 4-1). It is factory aligned and does not require any further alignment after it has been installed in the barrel assembly. Make sure the threaded opening in the barrel assembly is clean.

(1) Apply a light coat of sealing compound (item 9, app D) to the threaded portion of the optical cell assembly (6, fig 4-1).

(2) Slide the optical cell assembly (6) into the barrel assembly and rotate it clockwise, using the flat surfaces, until it is secure.

(3) Clean any excess sealing compound that may form in the area around the optical cell assembly (6).

(4) Purge and charge the barrel assembly in accordance with instructions given in paragraph 2-9.

(5) Install the lens guard (2) on the barrel assembly and rotate it clockwise until it is secure.

4-3. **Plasma Laser Tube.**

a. *Description.* The plasma laser tube (11, fig 4-1) is a helium-neon gas type. The glass portion of the plasma laser tube is permanently enclosed in a stainless steel jacket with only the light-emitting surfaces at the front exposed. The rear of the jacket, which is slightly enlarged, is clamped in the barrel assembly and sealed by a preformed packing. Two high voltage connectors on the rear of the plasma laser tube mate with connectors on the high voltage power supply; the connection is made when the barrel assembly is fastened to the electronics assembly. A flange is provided on the rear of the plasma laser tube to allow easy removal.

b. *Removal of Plasma Laser Tube.*

(1) Remove barrel assembly as follows:

(a) Loosen the four internal bolts and lock washers (1 and 2, fig 4-3) that secure the barrel assembly (3) to the electronics assembly (4).

(b) Separate the barrel assembly (3) from the electronics assembly (4).

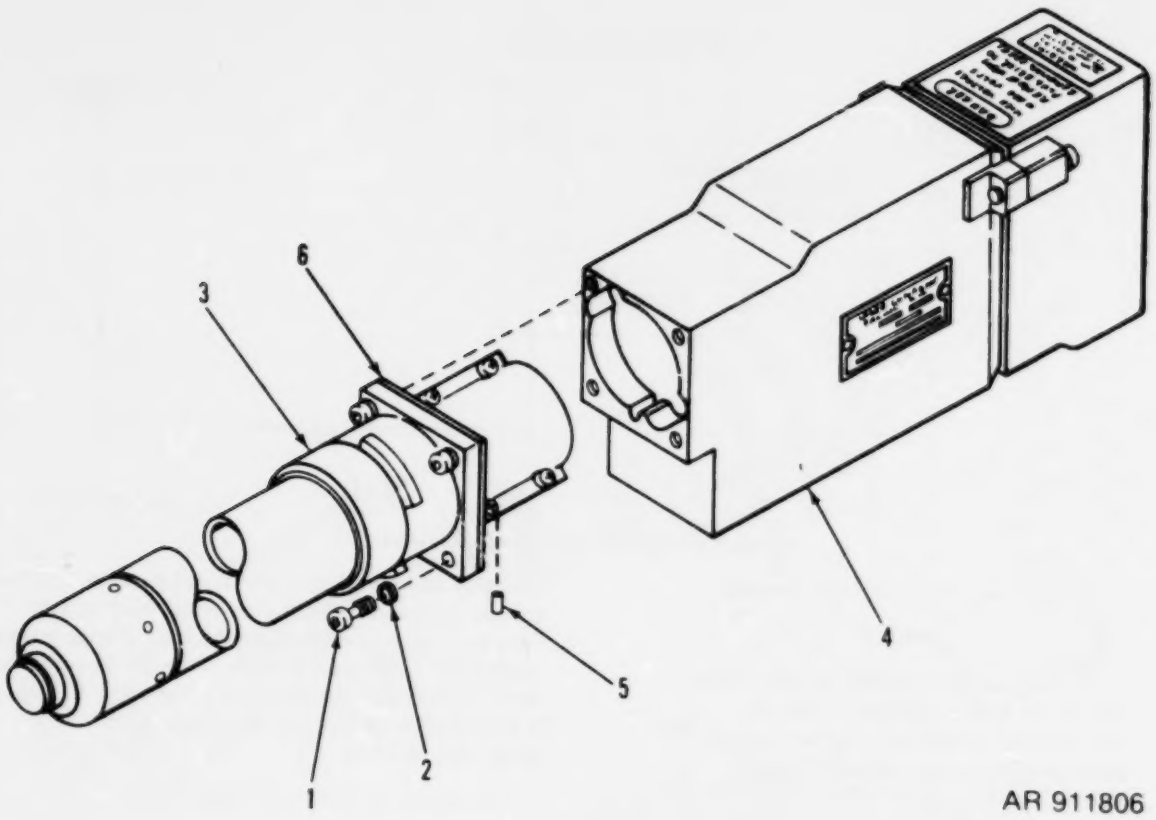
NOTE

When the barrel assembly separates from the electronics assembly, make sure the laser plasma shielding gasket (6) is retained by the internal bolts (1).

(2) Remove the lens guard (2, fig 4-1) on barrel assembly. Release the internal pressure by loosening machine screw (3).

(3) Loosen the four socket head cap screws (8, fig 4-1) and lock washers (9) that secure the tube clamp (10) over the plasma laser tube (11).

(4) Remove the tube clamp (10).



Legend for fig 4-3.

1. Internal bolt - 11737730
2. Lock washer - MS35338-138
3. Barrel assembly - 11741701
4. Electronic component - 11737724
5. Straight pin - 11737742
6. Laser plasma shielding gasket - 11737729

Figure 4-3. Removal and installation of barrel assembly

(5) Remove the two special screws (5, fig 4-4) that secure the rear cover of the electronics assembly.

(6) Install the two socket head cap screws, removed in step (4) above, in the tapped holes on the plasma tube flange.

(7) Tighten both screws until the plasma laser tube (11, fig 4-1) retracts enough to grasp with your hand.

(8) Gently slide the plasma laser tube out of the barrel assembly.

(9) Remove the two socket head cap screws from the plasma tube flange.

(10) Secure the rea cover to the electronic components using the two special screws (5, fig 4-4).

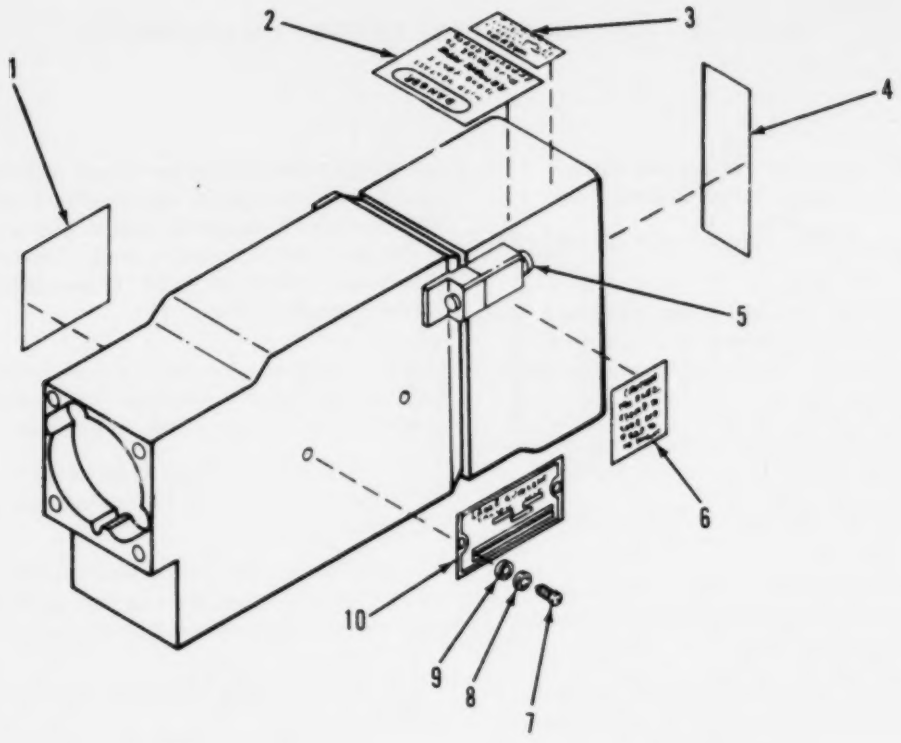
c. *Installation of Plasma Laser Tube.*

CAUTION

When installing the plasma laser tube (11, fig 4-1), take care not to get any fingerprints on the face of the plasma laser tube.

(1) Inspect the O-ring (12) and apply a light coat of grease (item 5, app D) to it before installing the plasma laser tube (11).

(2) Carefully insert the plasma laser tube into the barrel assembly, making sure the straight pin (15) on the barrel assembly slides into the slot in the bottom portion of the tube clamp (10). (See the breakaway of the tube in the figure.)



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Legend for fig 4-4.

1. Identification marker - 11741698
2. Identification marker - 11741691
3. Identification marker - 11741693
4. Identification marker - 11741690
5. Special screw - 11737790
6. Instruction plate - 10556212
7. Machine screw - MS51958-1
8. Lock washer - MS35333-69
9. Flat washer - MS15795-802
10. Identification plate - 11741692

Figure 4-4. Electronic components - instruction and identification plate and identification markers

CAUTION

The four socket head cap screws (8) that secure the tube clamp (10) must be tightened with a torque of 9 ± 1/2 inch-pounds.

(3) Install the tube clamp (10) and secure it with four socket cap screws (8) and washers (9).

(4) Tighten the machine screw (sealing) (3).

(5) Install barrel assembly (3, fig 4-3) on the electronic components (4) as follows:

NOTE

Before installing the barrel assembly, inspect the barrel gasket and make sure it is not torn or defective.

(a) Position the barrel assembly (3) so its straight pin (5) is aligned with the keyway on the electronic components (4).

(b) Secure the barrel assembly to the electronic components by tightening the four internal bolts (1).

(6) Purge and charge the barrel assembly in accordance with instructions given in paragraph 2-9.

(7) Install the lens guard (2, fig 4-1) on the barrel assembly and rotate it clockwise until it is secure.

Section II. REPAIR OF ELECTRONIC COMPONENTS

4-4. Electronic Components Instruction Plate, Identification Markers, and Identification Plate.

a. *Removal of Instruction Plate or Identification Markers.*

(1) Apply acetone (item 1, app D) to the instruction plate/identification markers (1, 2, 3, 4, or 6, fig 4-4) to dissolve the adhesive backing on the plate or markers.

(2) When the adhesive has dissolved sufficiently, peel the instruction plate or markers off the laser.

b. *Installation of Instruction Plate or Identification Markers.*

(1) Clean the surface of the laser where the instruction plate or identification markers are to be installed.

(2) Peel the liner off the back of the instruction plate or identification markers to be installed.

(3) Install the instruction plate or indentification markers on the designated area making sure there are no wrinkles on the plate.

c. *Removal of the Identification Plate.*

(1) Remove the two machine screws (7), lock washers (8), and flat washers (9) that secure the identification plate (10) to the laser.

(2) Remove the identification plate.

d. *Installation of the Identification Plate.*

(1) Clean the surface of the laser where the identification plate is to be mounted.

(2) Install the identification plate (10) on the laser and secure it with the two machine screws (7), lock washers (8), and flat washers (9).

4-5. Electronic Components - Rear Cover Components.

a. *Description.* The rear cover contains various switches and indicators that control and indicate the operating functions of the laser. The LASER SAFE FIRE circuit breaker (6, fig 4-5), and the MODE CONT FLASH toggle switch (7) determine whether power is applied to the laser and its operating mode. The LASER ON glow lamp (12) and TRIGGER ON incandescent lamp (11) indicate these conditions.

b. *Preliminary Repair Procedure.* Perform the following preliminary procedure before attempting to remove any of the rear cover components.

(1) Loosen the two special screws (1, fig 4-5) that secure the rear cover to the electronic components and open the rear cover.

(2) Remove the two machine screws (3) and lock washers (4) that secure the assembly clamp (5) to the rear cover. Extract the assembly clamp.

c. *Removal of LASER SAFE FIRE Circuit Breaker.*

(1) Unsolder the wires from terminal 1 on the LASER SAFE FIRE circuit breaker (6) and tag them for later identification.

(2) Unsolder the wires from terminal 2 on the LASER SAFE FIRE circuit breaker and tag them for later identification.

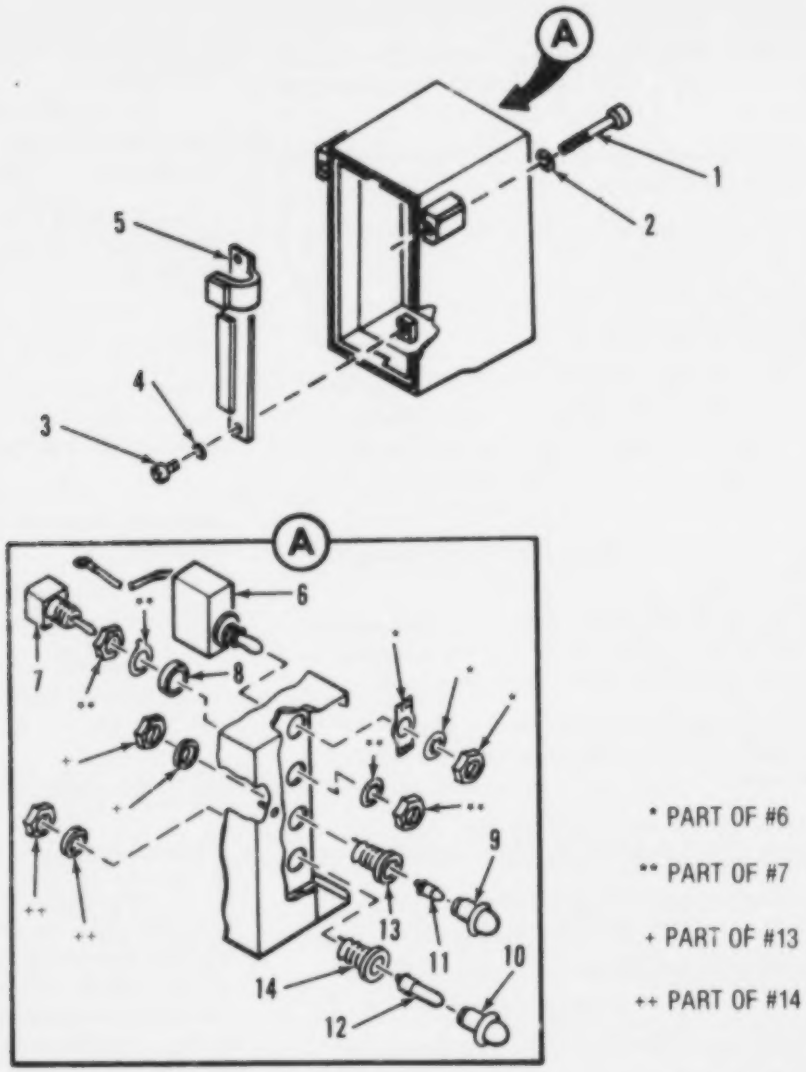
(3) Remove the circuit breaker (6) retaining hardware and then extract the circuit breaker from the rear cover.

d. *Installation of LASER SAFE FIRE Circuit Breaker.*

(1) Insert the circuit breaker (6) in the assigned hole on the rear cover; secure it with the retaining hardware.

(2) Connect and solder (item 8, app D) the wires, previously identified, to terminal 1 on the circuit breaker.

(3) Connect and solder the wires, previously identified, to terminal 2 on the circuit breaker.



Legend for fig 4-5.

1. Special screw - 11737790
2. Lock washer - MS35338-139
3. Machine screw - MS51957-28
4. Lock washer - MS35338-136
5. Assembly clamp - 11737759
6. Circuit breaker - M39019/1-31
7. Toggle switch - MS27719-23
8. Packing with retainer - MS25196-1
9. Light lens - 11737708-2
10. Light lens - 11737708-3
11. Incandescent lamp - MS18209-387
12. Glow lamp - MS25252-C7A
13. Indicator light - 11737726-1
14. Indicator light - 11737726-2

Figure 4-5. Electronic components - rear cover components

e. *Removal of MODE CONT FLASH Toggle Switch.*

(1) Unsolder the wire from terminal 2 on the MODE CONT FLASH toggle switch (7) and tag it for later identification.

(2) Unsolder the wire from terminal 3 and tag it for later identification.

(3) Unsolder the wire from terminal 6 and tag it for later identification.

(4) Unsolder the wire from terminal 5 and tag it for later identification.

(5) Unsolder the wires from terminal 4 and tag them for later identification.

(6) Remove the hardware and packing with retainer (8, fig 4-5) that secures the toggle switch (7) to the rear cover. Extract the switch.

f. *Installation of MODE CONT FLASH Toggle Switch.*

(1) Insert the toggle switch (7) in the assigned hole on the rear cover; secure it with its associated retaining hardware and packing with retainer (8).

(2) Connect and solder (item 8, app D) the wires, previously identified, to terminal 4 on the toggle switch.

(3) Connect and solder the wire, previously identified, to terminal 5 on the toggle switch.

(4) Connect and solder the wire, previously identified, to terminal 6 on the toggle switch.

(5) Connect and solder the wire, previously identified, to terminal 3 on the toggle switch.

(6) Connect and solder the wire, previously identified, to terminal 2 on the toggle switch.

g. *Removal of TRIGGER ON or LASER ON Lamp Assembly.*

(1) Unscrew the light lens (9 or 10, fig 4-5) which houses the incandescent lamp (11) or the glow lamp (12), and remove it from the rear cover.

(2) Unsolder the wire from the center terminal on the indicator light (13 or 14) and tag it for later identification.

(3) Unsolder the wire from the outer terminal on the indicator light (13 or 14) and tag it for later identification.

(4) Remove the hardware that secures the indicator light to the rear cover and extract the indicator light.

h. *Installation of TRIGGER ON or LASER ON Lamp Assembly.*

(1) Insert the indicator light (13 or 14) into the assigned hole on the rear cover; secure it with its associated retaining hardware.

(2) Connect and solder (item 8, app D) the wire, previously identified, to the outer terminal on the indicator light.

(3) Connect and solder the wire, previously identified, to the center terminal on the indicator light.

(4) Install incandescent lamp (11) or glow lamp (12) in indicator light (13 or 14) and screw in light lens (9 or 10).

4-6. **Power Supply.**

a. *Description.* The power supply module is mounted on a slide within the electronics enclosure (fig 4-6). It provides the voltages required for operation of the laser using a nominal input of 24 vdc from the vehicle electrical system. Three major functional circuits comprise the power supply module: (1) a series path regulator circuit, (2) a switching circuit, and (3) a voltage sextupler. Figure 4-7 contains a functional diagram of the power supply.

b. *Removal of Power Supply Module.* Grasp the bracket on the power supply and pull outward until the power supply module clears the electronics enclosure (fig 4-6).

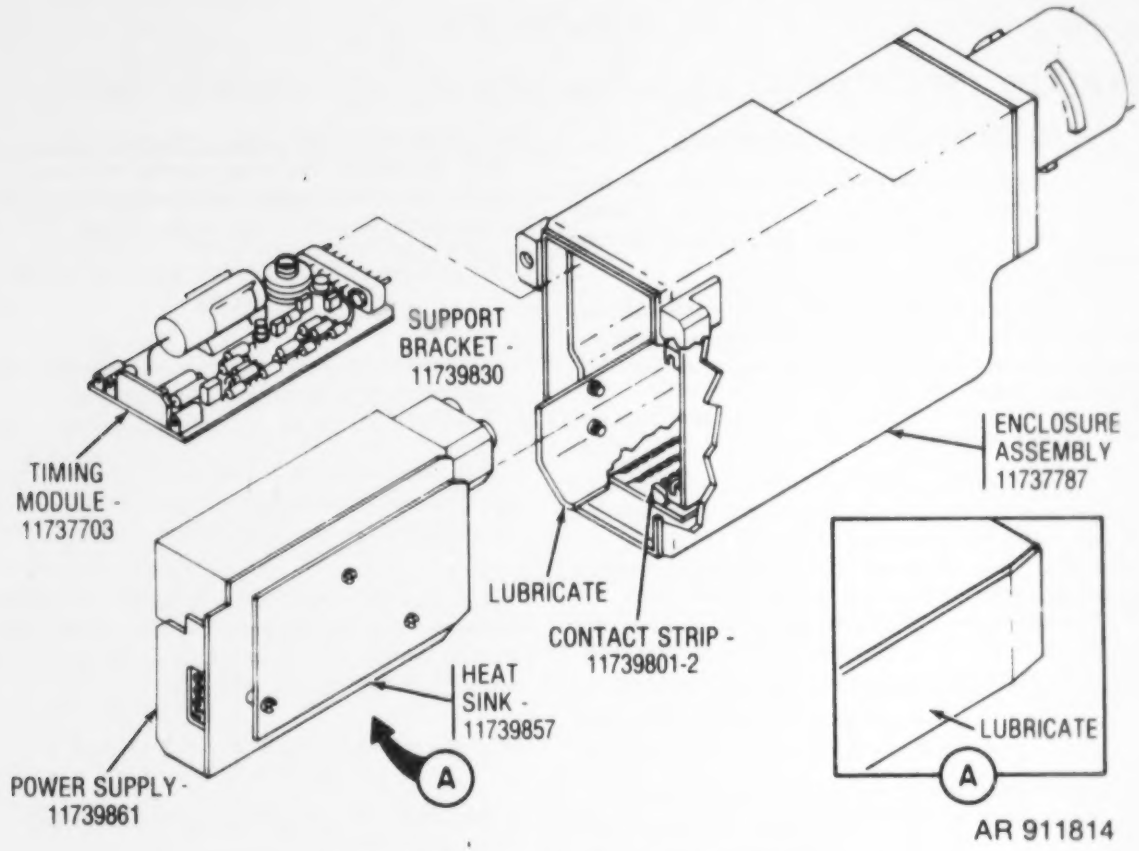


Figure 4-6. Power supply and timing modules

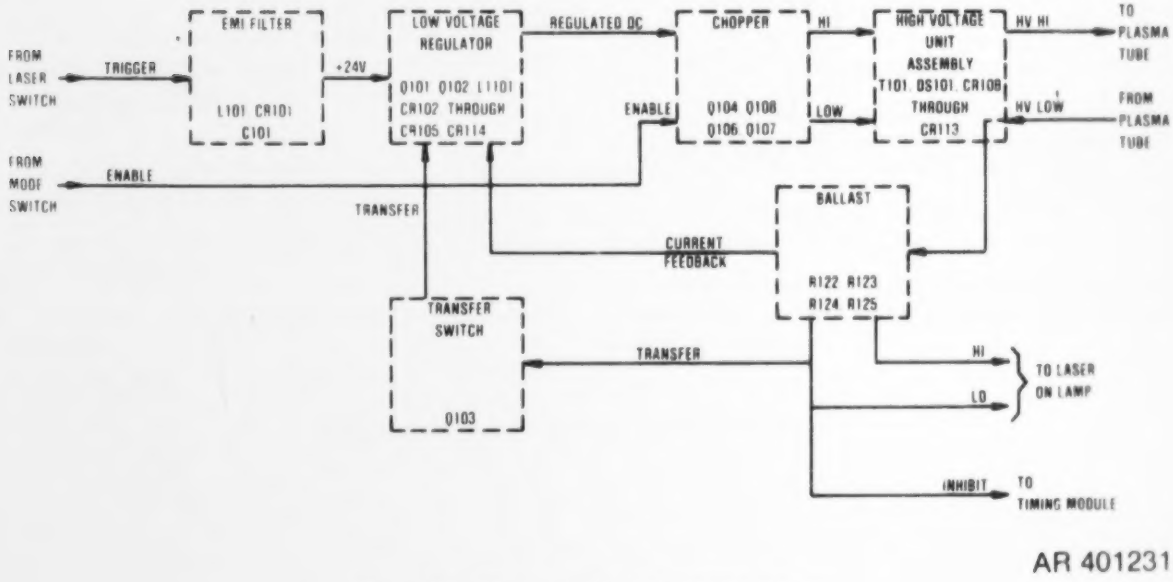


Figure 4-7. Power supply - functional diagram

c. *Installation of Power Supply Module.*

(1) Lubricate the fingers and bracket in the electronics enclosure and the heat sink bracket on the power supply module (fig 4-6) in accordance with instructions given in paragraph 3-7.

(2) Insert the power supply module into the electronics enclosure until its connectors mate with the connector in the enclosure and the two connectors on the plasma tube.

4-7. **Timing Module.**

a. *Description.* The timing module (fig 4-6) is a complete solid-state, plug-in module that is mounted in a slide within the electronics enclosure. The timing module provides the desired electronic shutter function when the system is operating in the FLASH mode. This function serves to energize the high voltage power supply (for 100 ± 25 milliseconds) which, in turn, activates the plasma laser tube each time the coax gun trigger, boresight fire switch, or lanyard switch is activated. Essentially, the timing module functions as a single-shot 100-millisecond switch. Figure 4-8 contains a functional diagram of the timing module.

NOTE

Remove the power supply module to facilitate the removal of the timing module.

b. *Removal of Timing Module.* Grasp the bracket on the timing module (fig 4-6) and pull outward until the module clears the electronics enclosure.

c. *Installation of Timing Module.* Slide the timing module into the guide support and push the module inward until its connector mates with the connector in the electronics enclosure.

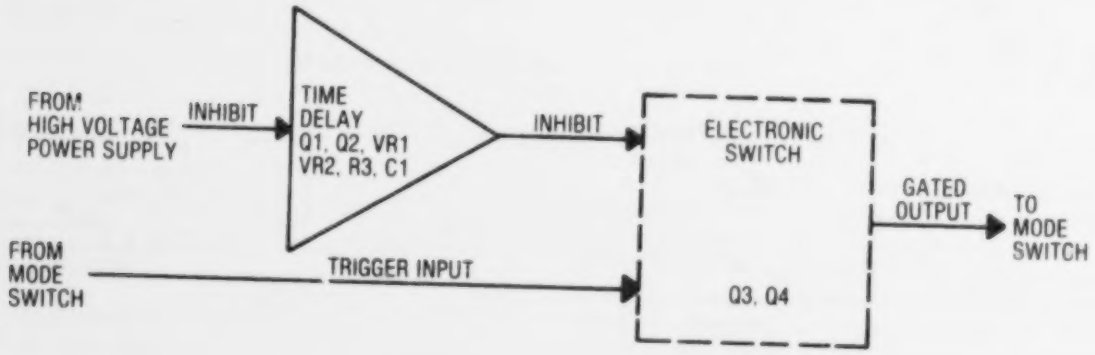


Figure 4-8. Timing module - functional diagram

CHAPTER 5

REPAIR OF COMPONENTS OF FIELD ARTILLERY DIRECT FIRE TRAINER

5-1. **Deflector Optical Assembly.**

a. *Description.* The deflector optical assembly provides for mounting and adjusting the deflector assembly.

b. *Disassembly.*

(1) Remove spring pin (1, fig 5-1), flat washer (3), and cushioning pad (4). Unscrew thumbscrew (2) from frame.

(2) Remove machine screws (5) and identification plate (6).

(3) Remove straight pins (7) from universal joints (8), and remove universal joints, straight shaft (9) and straight rod (10).

(4) Remove knob (11), scale (12), clip (13), straight pin (14), adapter (15), and straight shaft (16).

(5) Remove hexagon head cap screw (17), lock washer (18), and deflector holder (19).

(6) Remove identification marker (20) as follows:

(a) Apply acetone (item 1, app D) to the identification marker to dissolve the adhesive backing on the marker.

(b) When the adhesive has dissolved sufficiently, peel the identification marker off the deflector optical assembly.

c. *Cleaning and Inspection.*

(1) Remove all dirt and corrosion.

(2) Inspect all parts for serviceability. Inspect threads of thumbscrew (2).

d. *Repair.* Replace all unserviceable authorized components.

e. *Assembly.*

(1) Install straight shaft (16). Slide adapter (15) on the shaft. Line up the pin holes and install straight pin (14).

(2) Install clip (13) in the groove of the adapter (15), and slide scale (12) over the adapter. Secure with knob (11).

(3) Install universal joints (8) to straight shaft (16), line up the pin holes and secure with straight pin (7).

(4) Install straight shaft (9) and straight rod (10) to universal joints, line up the pin holes and secure with straight pins (7).

(5) Install identification plate (6). Apply sealing compound (item 8, app D) to threads of machine screws (5) and secure plate with screws.

(6) Install thumbscrew (2) into frame. Place flat washer (3) and cushioning pad (4) on thumbscrew and secure with spring pin (1).

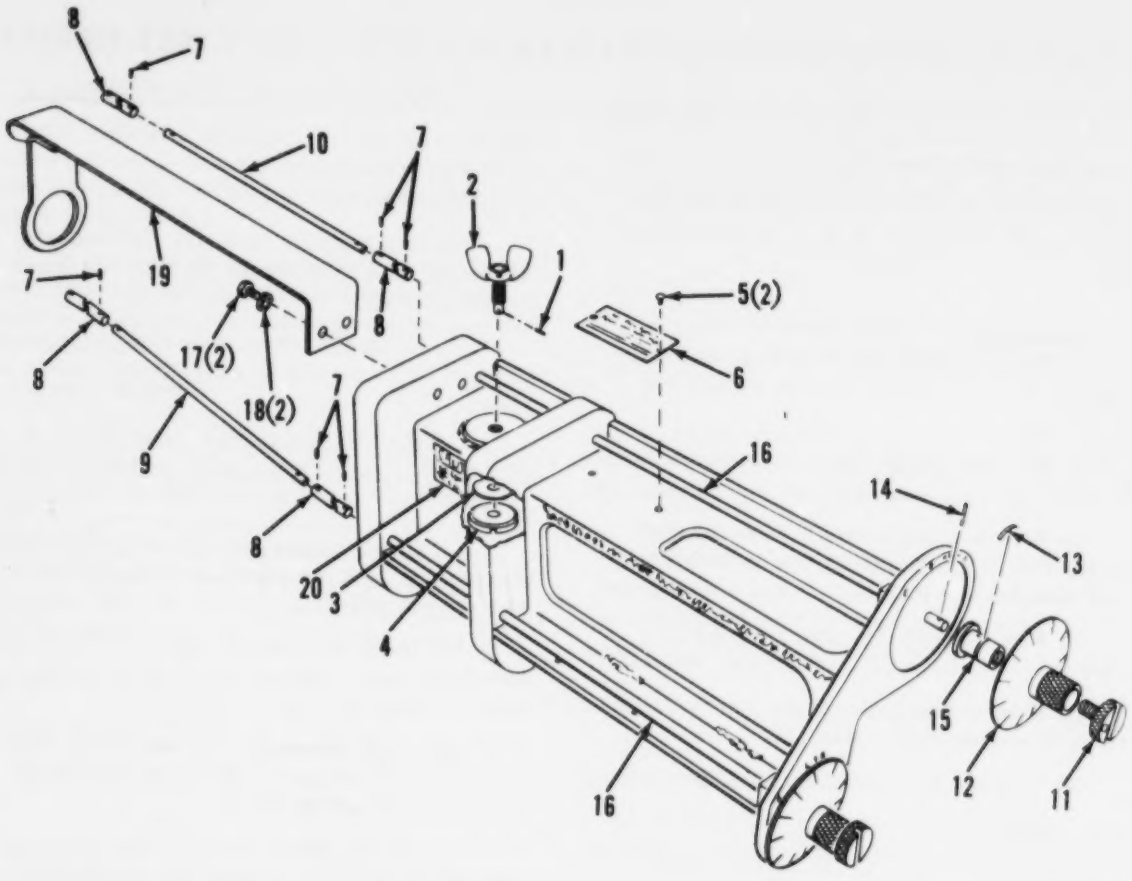
(7) Install deflector holder (19) to frame, and secure with lock washer (18) and hexagon head cap screw (17).

(8) Install identification marker (20) as follows:

(a) Clean the surface of the deflector optical assembly where the identification marker is to be installed.

(b) Peel the liner off the back of the identification marker to be installed.

(c) Install the identification marker on the designated area making sure there are no wrinkles on the identification marker.



Legend for fig 5-1.

1. Spring pin - MS16562-193
2. Thumbscrew - 11746417
3. Flat washer - 11746419
4. Cushioning pad - 11746420
5. Machine screw - MS51957-3
6. Identification plate - 11746493
7. Straight pin - MS16555-604
8. Universal joint - MS20270B6
9. Straight shaft - 11746415-3
10. Straight rod - 11746415-2
11. Knob - 11746414
12. Scale - 11746413
13. Clip - 8634478
14. Straight pin - MS16555-620
15. Adapter - 11746412
16. Straight shaft - 11746415-1
17. Hexagon head cap screw - MS35307-304
18. Lock washer - MS35338-139
19. Deflector holder - 11728997
20. Identification marker - 11741698

Figure 5-1. Deflector optical assembly

5-2. **Deflector Assembly.**

a. *Description.* The deflector assembly provides initial beam alignment in addition to elevation and deflection adjustment during zeroing procedures and when implementing inputs from the deflection tables.

b. *Removal of Components.*

(1) Remove washer insulator (3, fig 5-2) and shoulder pin (4).

(2) Remove ring (5). If ring is to be replaced, remove and retain the five setscrews (9).

NOTE

Do not allow excess sealing compound to remain on the internal threads of ring.

c. *Installation of Components.*

(1) If ring (5) was replaced, seal five of the holes with sealing compound (item 8, app D) and the five setscrews removed in (b) above.

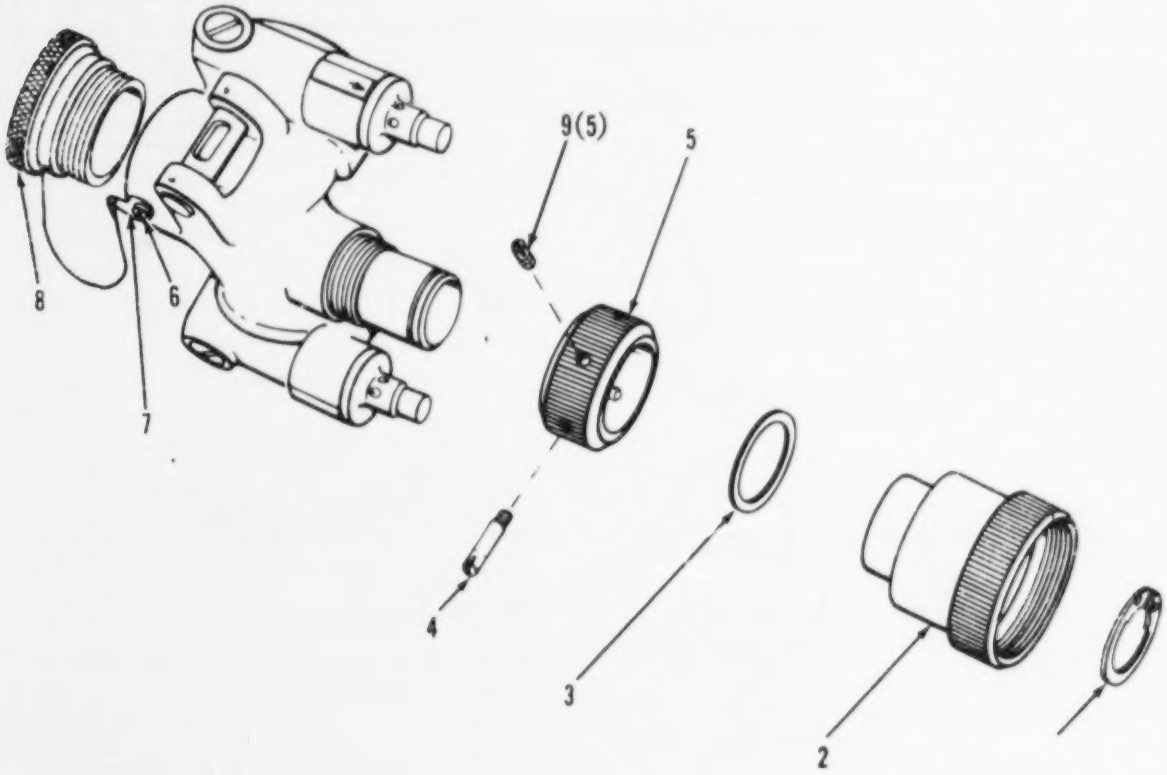
(2) Install ring (5), shoulder pin (4), and washer insulator (3).

(3) Install adapter (2) and ring (1).

d. *Removal of Plug Assembly.*

(1) Remove machine screw (6, fig 5-2) and flat washer (7).

(2) Remove plug assembly (8).



Legend for 5-2.

1. Ring - MS16626-4118
2. Adapter - 11746423
3. Washer insulator - 11746470-2
4. Shoulder pin headless - 11746425
5. Ring - 11746424
6. Machine screw - MS51957-12
7. Flat washer - MS15795-803
8. Plug assembly - 11748075
9. Setscrew - MS51958-19

Figure 5-2. Deflector assembly

e. *Installation of Plug Assembly.*

(1) Install plug assembly (8).

(2) Install flat washer (7) and machine screw (6).

5-3. **Control Box Assembly.**

a. *Description.* The control box assembly provides for power connection, lanyard connection, and boresight switch.

b. *Removal of BORESIGHT OFF FIRING Switch.*

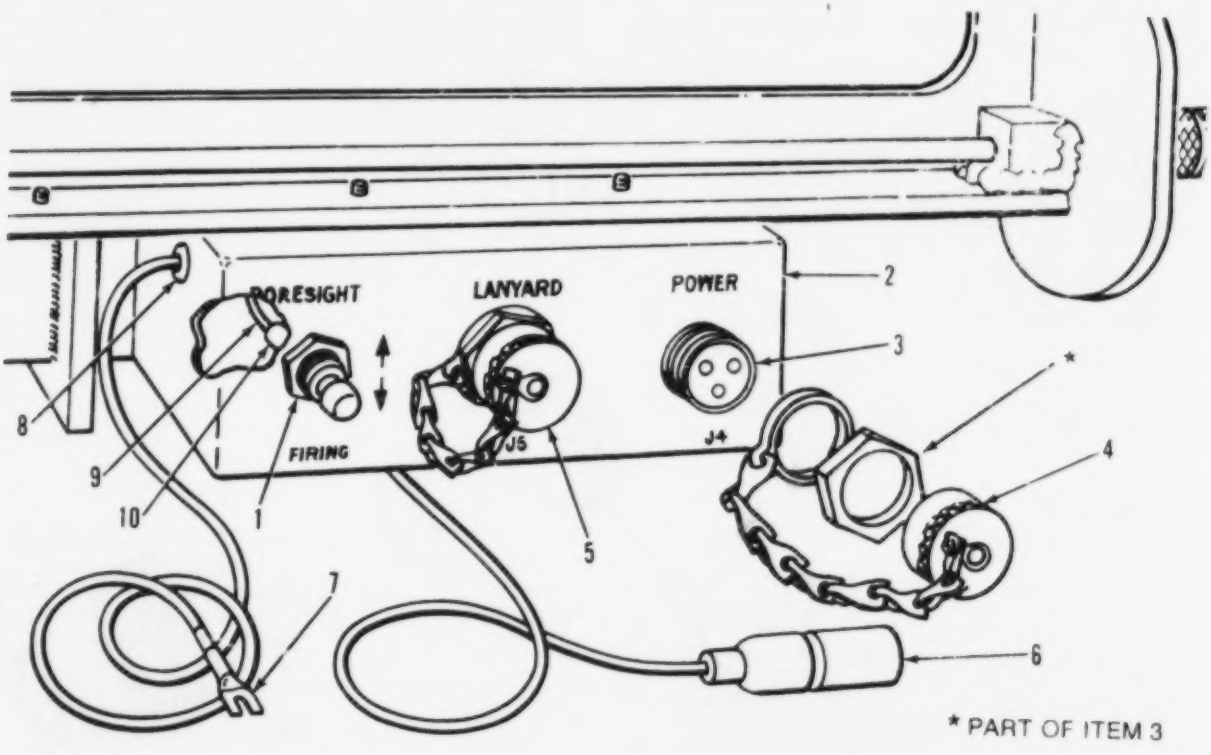
(1) Remove switch (1) from mounting hole in box (2).

(2) Remove the wires from terminal 1 on switch (1, fig 5-3) and tag them for later identification.

(3) Remove cable (9) from terminal 2 on switch (1) and remove cable and insulation sleeving (10).

(4) Unsolder wire from terminal 3 on switch (1) and tag it for later identification.

(5) Remove the switch retaining hardware and then extract switch (1) from box (2).



Legend for fig 5-3.

1. Switch - MS24612-312K
2. Box - 11746457
3. Receptacle connector - MS3114E12-3P
4. Electrical cover - MS3181-12N
5. Receptacle connector - MS3114E12-3S
6. Electric plug connector - MS27144-2
7. Lug terminal - MS35440-1
8. Rubber grommet - MS35490-27
9. Cable - MIL-C-13486/1
10. Insulation sleeving - MIL-I-23053/5

Figure 5-3. Control box assembly

c. *Installation of BORESIGHT OFF FIRING Switch.*

(1) Attach wires previously identified to terminal 1 on switch (1).

(2) Install insulation sleeving (10) on cable (9) and attach cable to terminal 2 on switch (1).

(3) Insert switch (1, fig 5-3) in the mounting hole on the front panel of box (2). Secure it with retaining hardware.

(4) Attach the wire previously identified to terminal 3 on switch (1).

d. *Removal of Power Connector J4.*

(1) Remove electrical cover (4) and retaining hardware from receptacle connector (3).

(2) Remove the wire from terminal A on receptacle connector (3) and tag it for later identification.

(3) Remove cable from terminal B on receptacle connector (3) and tag it for later identification. Extract connector from the front panel of box (2).

e. *Installation of Power Connector J4.*

NOTE

Before installing power connector check for bent pins.

(1) Attach wire previously identified to terminal A on receptacle connector (3).

(2) Attach cable to terminal B on receptacle connector (3).

(3) Insert receptacle connector (3) in the mounting hole on the front panel of box (2). Slip the ring attached to electrical cover (4) on the threads of receptacle connector (3). Secure it with the retaining hardware.

f. *Removal of Lanyard Connector J5.*

(1) Remove cover and retaining hardware from receptacle connector (5) and remove from the front panel of box (2).

(2) Remove the wire from terminal A on receptacle connector (5) and tag it.

(3) Remove the wire from terminal B on receptacle connector (5) and tag it.

g. *Installation of Lanyard Connector J5.*

(1) Attach wire previously identified to terminal A on receptacle connector (5).

(2) Attach wire previously identified to terminal B on receptacle connector (5).

(3) Insert receptacle connector (5) in the mounting hole on the front panel of box (2). Slide ring attached to cover onto threads of receptacle connector (5) and secure it with the retaining hardware.

h. *Removal of Electric Plug Connector.* Unsolder electrical plug connector (6) from cable.

i. *Installation of Electric Plug Connector.* Insert cable into electrical plug connector (6) and solder (item 8, app D).

j. *Removal of Lug Terminal.* Unsolder lug terminal (7) from cable and inspect rubber grommet (8) for cracks and replace if necessary.

k. *Installation of Lug Terminal.* Solder (item 8, app D) lug terminal (7) to cable.

5-4. **Cable Assembly (20 ft)**

a. *Description.* This cable assembly (20 ft, fig 5-4) connects the distribution box connector (J3) to the power connector (J4) on the control box assembly. Three of these cable assemblies are provided. Any one of these cables connects the 10 foot cable to the distribution box with the use of the adapter cable, or two of the cables can be connected with the use of the adapter cable.

NOTE

The instructions for removal and installation are the same for both connectors.

b. *Removal of Electrical Plug Connector.*

(1) Remove electrical cover (1, fig 5-4) from electrical plug connector (2) by rotating counterclockwise.

(2) Loosen machine screw (3) and slide loop clamp (4) back on the cable.

(3) Loosen rear part of electrical plug connector (2) by rotating it counterclockwise and slide back to expose soldered connections.

(4) Unsolder wires from pins A and B, tagging each wire for later identification.

c. *Installation of Electrical Plug Connector.*

NOTE

Before installing electrical plug connectors, check for broken or bent pins.

(1) Solder (item 8, app D) wires to pins A and B.

(2) Engage rear part of electrical plug connector with front and secure by turning clockwise until tight.

(3) Slide loop clamp (4) onto electrical plug connector (2) and secure by tightening machine screw (3).

(4) Check for continuity between electrical plug connector and cable.

(5) Secure electrical cover (1) on front of electrical plug connector (2) by rotating clockwise.

5-5. **Cable Assembly (10 ft).**

a. *Description.* This cable assembly (10 ft) (fig 5-5) connects the distribution box to the 24 vdc power supply, or can connect directly to control box J4 and 24 vdc power supply. A fuse has been placed in the 24 volt line of the cable at the positive (+) battery terminal.

b. *Removal of Electrical Plug Connector.*

NOTE

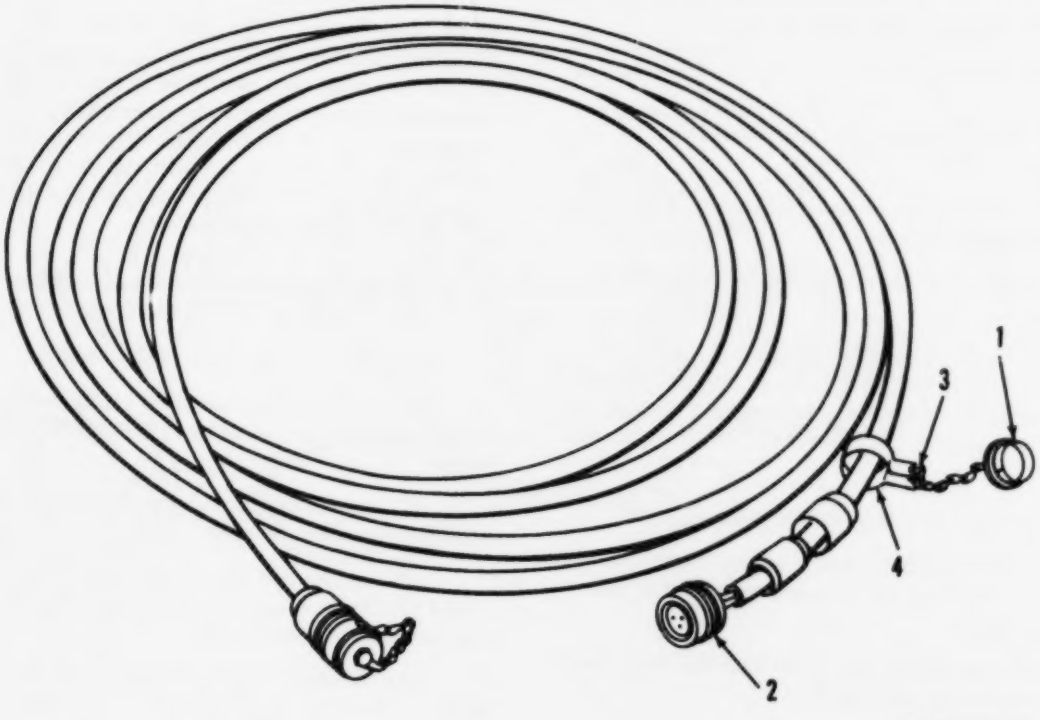
Cable assembly should be disconnected from 24 vdc supply.

(1) Remove electrical cover (1, fig 5-5) rotating counterclockwise.

(2) Loosen machine screw (2) and slide loop clamp (3) back on the cable.

(3) Loosen rear part of electrical plug connector (4) by rotating it counterclockwise. Slide back to expose soldered connections.

(4) Unsolder wires from pins A and B on electrical plug connector (4). Tag each wire for later identification.



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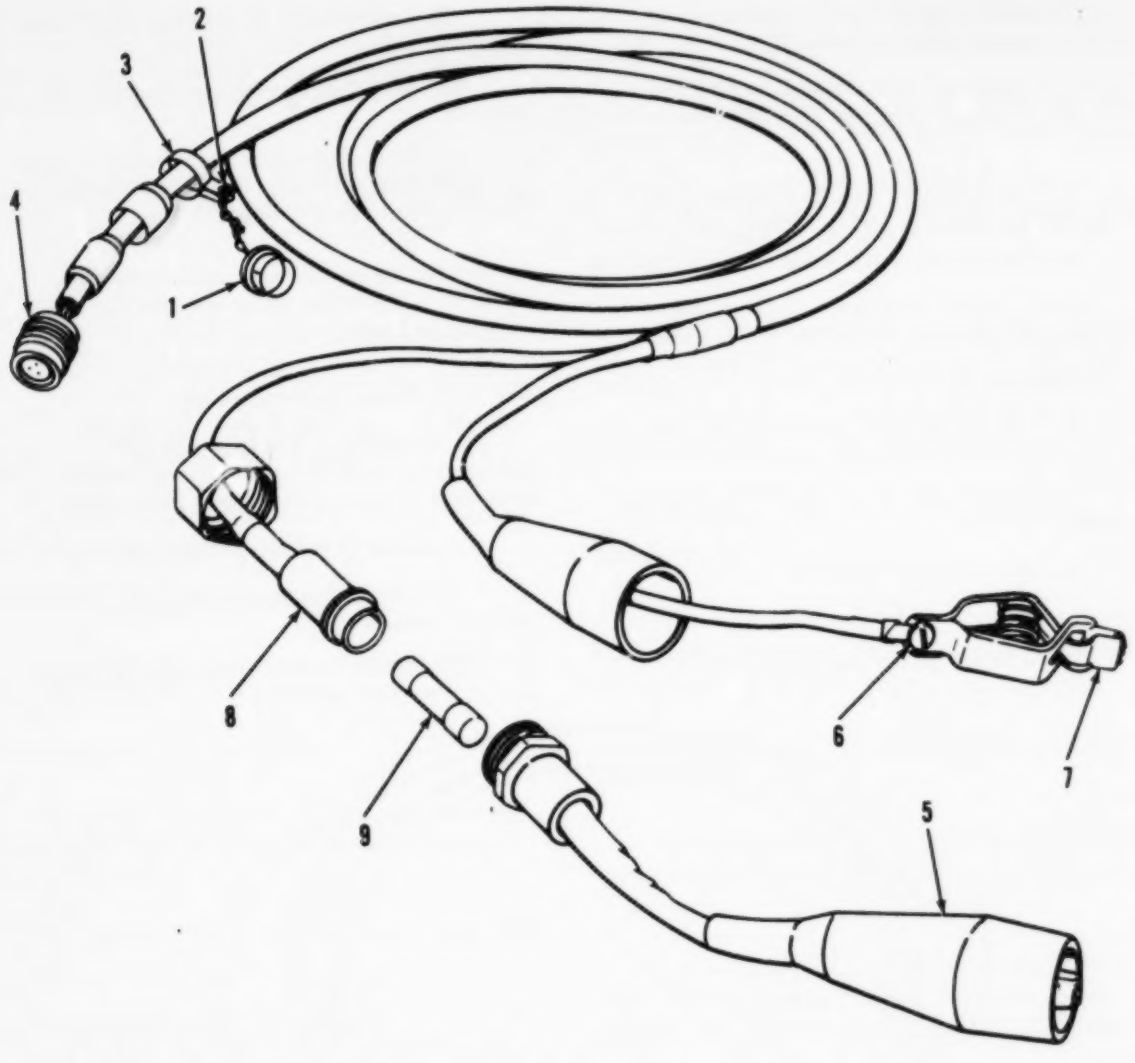
Legend for fig 5-4.

1. Electrical cover - MS3180-12C
2. Electrical plug connector - 11746453-2
3. Machine screw - MS51957-28
4. Loop clamp - MS122911

Figure 5-4. Removal and installation of cable assembly (20 ft) components



AR 911818

Legend for fig 5-5.

1. Electrical cover - MS3181-12C
2. Machine screw - MS 51957-28
3. Loop clamp - MS122911
4. Electrical plug connector - 11746453-1
5. Insulator
6. Screw
7. Electrical clip black - WC440TYPEPC4B
8. Fuseholder - 11746479
9. Fuse cartridge - FO9A250V10A-S

Figure 5-5. Removal and installation of cable assembly (10 ft) components

c. *Installation of Electrical Plug Connector.*

(1) Solder (item 8, app D) wires to pins A and B on electrical plug connector (4).

(2) Engage rear part of electrical plug connector with front and secure by turning clockwise until tight.

(3) Slide loop clamp (3) on electrical plug connector (4) and secure it with machine screw (2).

(4) Check continuity of cable.

(5) Rotate electrical cover (1) clockwise on electrical plug connector (4) and tighten securely.

d. *Removal of Clips.*

(1) Slide insulator (5) back to expose screw (6).

(2) Disconnect electrical clip (7) by removing screw (6).

e. *Installation of Electrical Clip.*

NOTE

Before installing electrical clip, check insulator for cracks.

(1) Slide insulator (5) on end of cable.

(2) Connect cable to electrical clip (7) with screw (6).

(3) Slide insulator (5) over electrical clip (7).

f. *Removal of Fuse.* Disconnect fuseholder (8) and remove fuse cartridge (9).

g. *Installation of Fuse.* Secure fuse cartridge (9) in fuseholder (8), reassemble and check continuity of cable.

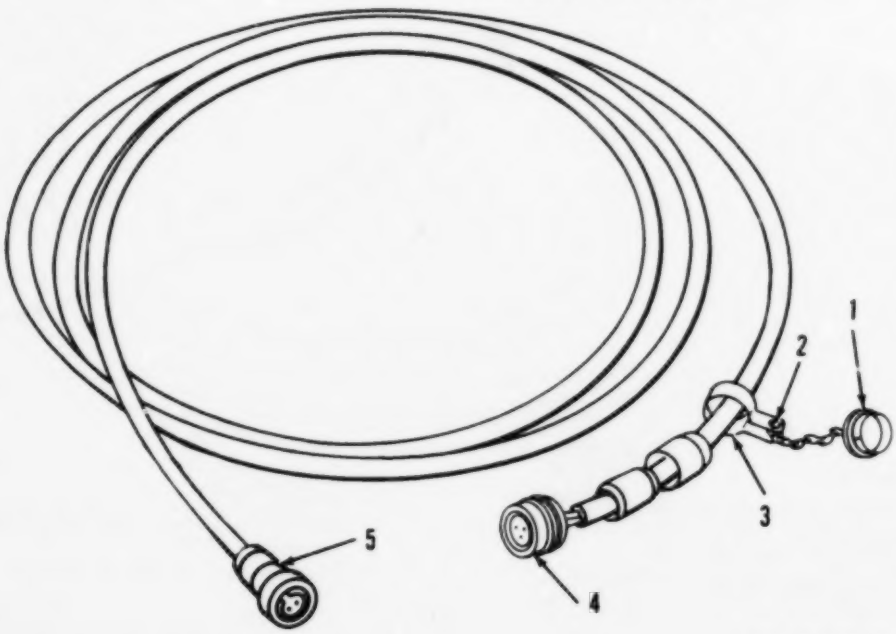
5-6. **M109 Power Cable Assembly.**

a. *Description.* This cable (fig 5-6) is used with the M109A1 only. It is an auxiliary power cable used in place of the 10 foot power cable.

b. *Removal of Electrical Plug Connector.*

(1) Remove electrical cover (1, fig 5-6) by rotating counterclockwise.

(2) Loosen machine screw (2) and slide loop clamp (3) back on cable.



AR 911819

Legend for fig 5-6.

1. Electrical cover - MS3180-12C
2. Machine screw - MS51957-28
3. Loop clamp - MS122911
4. Electrical plug connector - 11746453-1
5. Straight plug - 8644364

Figure 5-6. Removal and installation of M109 cable assembly components

(3) Loosen rear part of electrical plug connector (4) by rotating it counterclockwise and slide back to expose soldered connections.

(4) Unsolder wires from pins A and B on electrical plug connector (4). Tag each wire for later identification.

c. *Installation of Electrical Plug Connector.*

(1) Solder (item 8, app D) wires to pins A and B on electrical plug connector (4).

(2) Engage rear part of connector with front and secure by turning clockwise until tight.

(3) Slide loop clamp (3) on electrical plug connector (4) and secure with machine screw (2).

(4) Check continuity of cable.

(5) Rotate electrical cover (1) clockwise on electrical plug connector (4) and tighten securely.

d. *Removal of Straight Plug.*

(1) Loosen rear part of straight plug (5) by rotating it counterclockwise and slide back to expose soldered connections.

(2) Unsolder wires. Tag each wire for later identification.

e. *Installation of Straight Plug.*

(1) Solder (item 8, app D) wires to pin.

(2) Engage rear part of straight plug with front and secure by turning clockwise until tight.

(3) Check continuity of cable.

5-7. Lanyard Switch.

a. *Description.* The lanyard switch (fig 5-7) connects the lanyard connector (J5) on the control box assembly to the howitzer. A snap hook is attached to the lanyard firing cord forward to the wooden knob. When pulled, the lanyard switch applies electrical power and fires the laser in flash or continuous mode.

b. *Removal of Target Assembly Plug.*

(1) Remove electrical cover (1, fig 5-7) from target assembly plug (2) by rotating counterclockwise.

(2) Loosen screws (3), disengage the rear of target assembly plug (2) by rotating counterclockwise, and slide it back on cable.

(3) Unsolder wires from pins A and B on target assembly plug (2). Tag each wire for later identification.

c. *Installation of Target Assembly Plug.*

(1) Solder (item 8, app D) wires to connector pins A and B.

(2) Slide the rear part of target assembly plug (2) forward and engage by rotating clockwise until secure. Tighten screws (3).

(3) Lock electrical cover (1) in place by rotating clockwise.

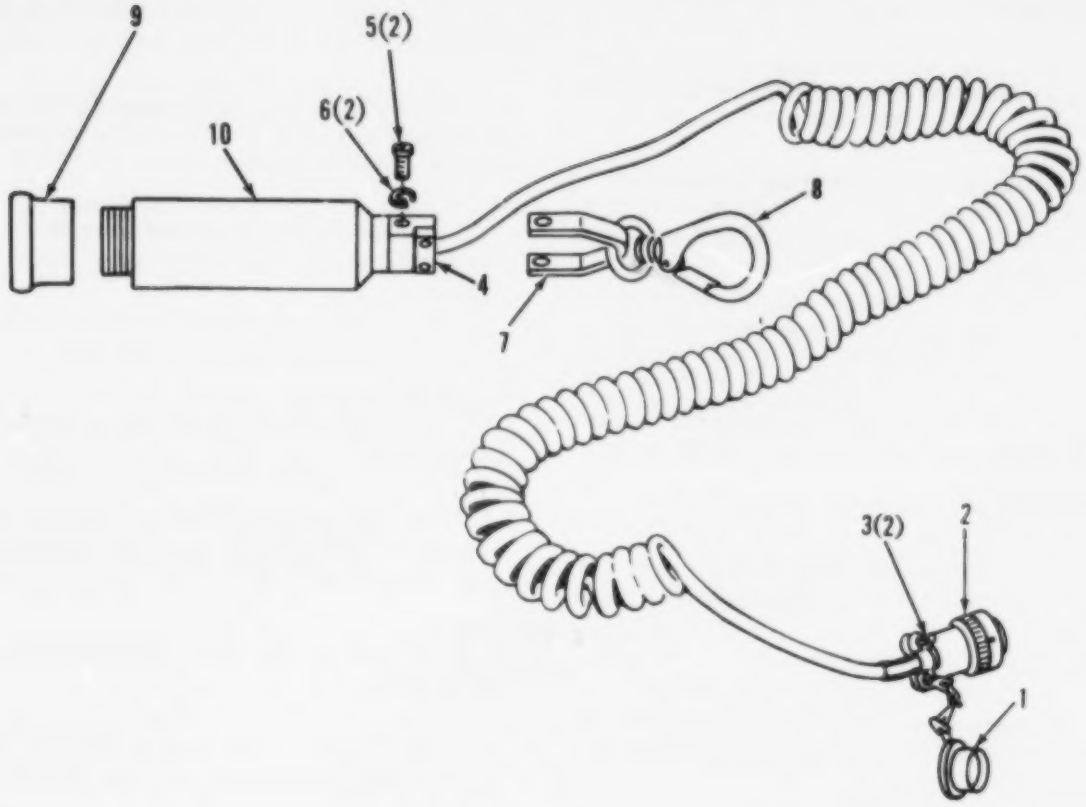
(4) Check continuity of cable when lanyard is pulled. Check that continuity is broken when lanyard is released.

d. *Removal of Snap Retaining Link and Swivel Eye Snap.* Remove machine screws (5) and lock washers (6), and slide snap retaining link (7) off cable clamp (4).

e. *Installation of Snap Retaining Link and Swivel Eye Snap.* Slide swivel eye snap (8) on snap retaining link (7) and position on cable clamp (4). Secure with machine screws (5) and lock washers (6).

f. *Removal of Electrical Connector Cover.* Remove electrical connector cover (9).

g. *Installation of Electrical Connector Cover.* Apply sealing compound (item 8, app D) to threads of handle (10) and install electrical connector cover (9).



AR 911820

Legend for fig 5-7.

1. Electrical cover - MS3180-12C
2. Target assembly plug - MS3116F-12-3P
3. Screw
4. Cable clamp - 11746490
5. Machine screw - MS51957-42
6. Lock washer - MS35338-137
7. Snap retaining link - 11746488
8. Swivel eye snap - 11746489
9. Cover, electrical connector - 11746486
10. Handle - 11746483

Figure 5-7. Removal and installation of lanyard switch components

5-8. **Adapter Cable Assembly.**

a. *Description.* The 12 inch adapter cable (fig 5-8) is used to mate two 20 ft cables, or can be used to mate the 10 foot cable to a 20 foot cable.

b. *Removal of Cable Plug Connector.*

(1) Disengage the rear of the cable plug connector (1 or 2, fig 5-8) by rotating it counterclockwise and slide it back on the cable.

(2) Slide insulation sleeving (3) back from solder connection.

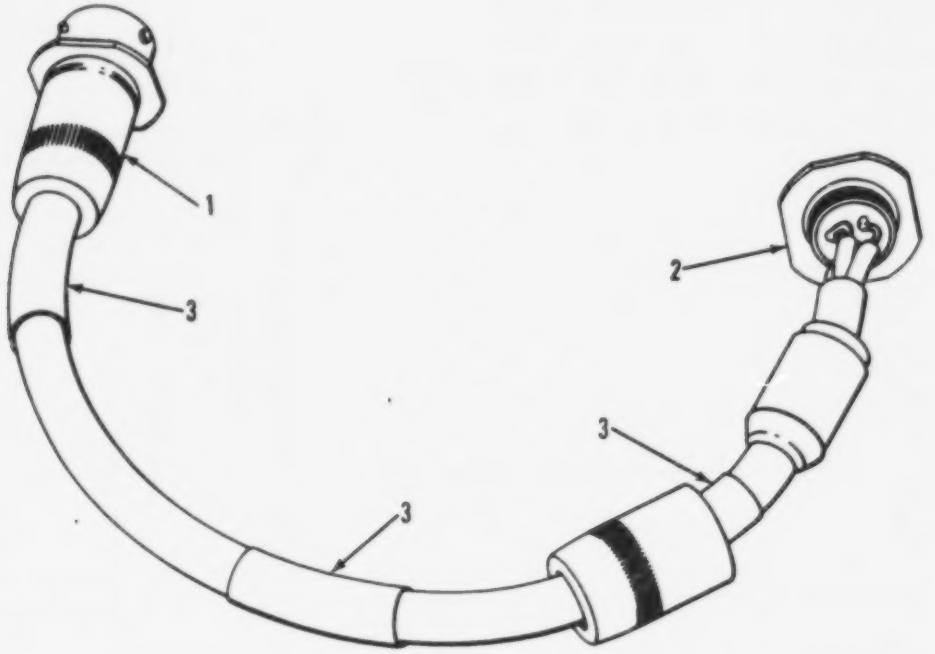
(3) Unsolder wires. Tag each wire for later identification.

c. *Installation of Cable Plug Connector.*

(1) Solder (item 8, app D) wires. Slide insulation sleeving (3) forward over solder connections.

(2) Slide rear part of cable plug connector forward and engage by rotating clockwise until secure.

(3) Check continuity of cable.



AR 911821

Legend for fig 5-8.

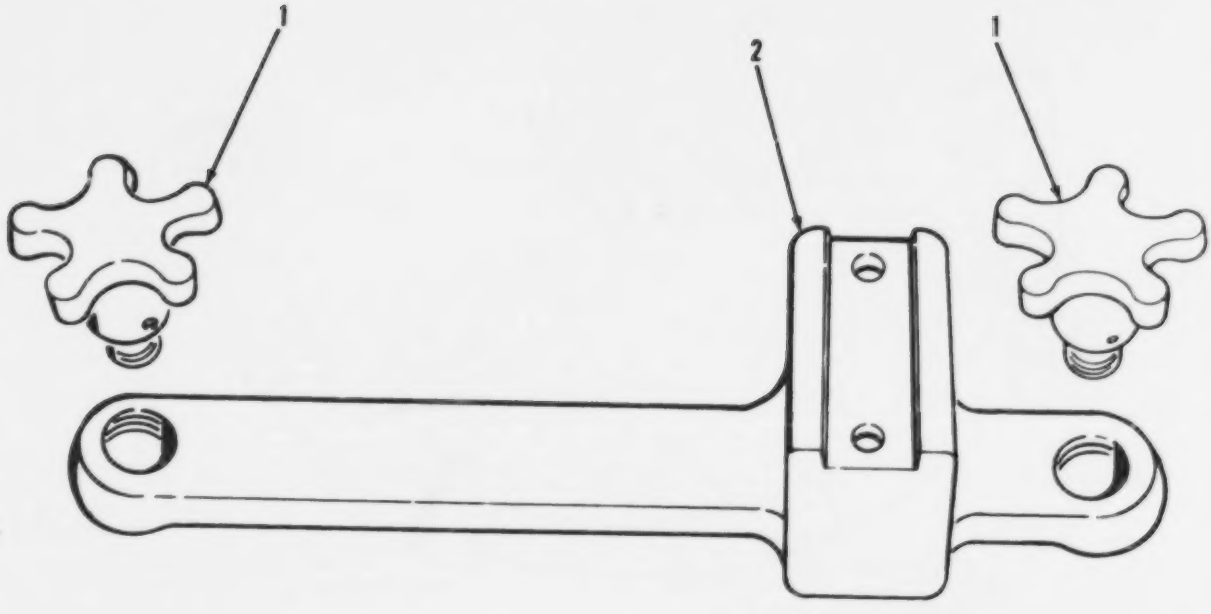
1. Cable plug connector - 11746455-1
2. Cable plug connector - 11746455-2
3. Insulation sleeving

Figure 5-8. Removal and installation of adapter cable assembly components

5-9. **M114 Adapter Assembly.**

a. *Removal.* Remove special knobs (1, fig 5-9) from adapter (2).

b. *Installation.* Install special knobs on adapter.



Legend for fig 5-9.

1. Special knob - 11746516
2. Adapter - 11746518

Figure 5-9. Removal and installation of adapter assembly components

CHAPTER 6

MAINTENANCE OF MATERIAL USED IN CONJUNCTION WITH THE LASER TRAINER AND ADFT

6-1. **General.** Refer to TM 9-6920-357-10-1 and 2 for operator/crew maintenance on the laser target set.

6-2. **Direct Support Maintenance of Laser Target Set (1, Fig 6-1).**

a. *Frame Assembly.* Replace frame assembly (2 fig 6-1) if it is bent, deformed, or corroded and unable to retain a target.

b. *Retroreflective Targets.*

CAUTION

Use a soft nonabrasive cloth to clean the retroreflective target surfaces.

(1) Clean the reflective surface of each retroreflective target (3 and 4, fig 6-1) with a solution of mild, soapy water and wipe dry with a clean cloth.

(2) If any oil, tar, or similar type of stain is on the target surface, use kerosene or naphtha to remove the stain and rinse with clean water.

(3) Inspect the reflective surfaces and replace any target whose surface is so worn, scratched, or marred that it would impair the training exercises.

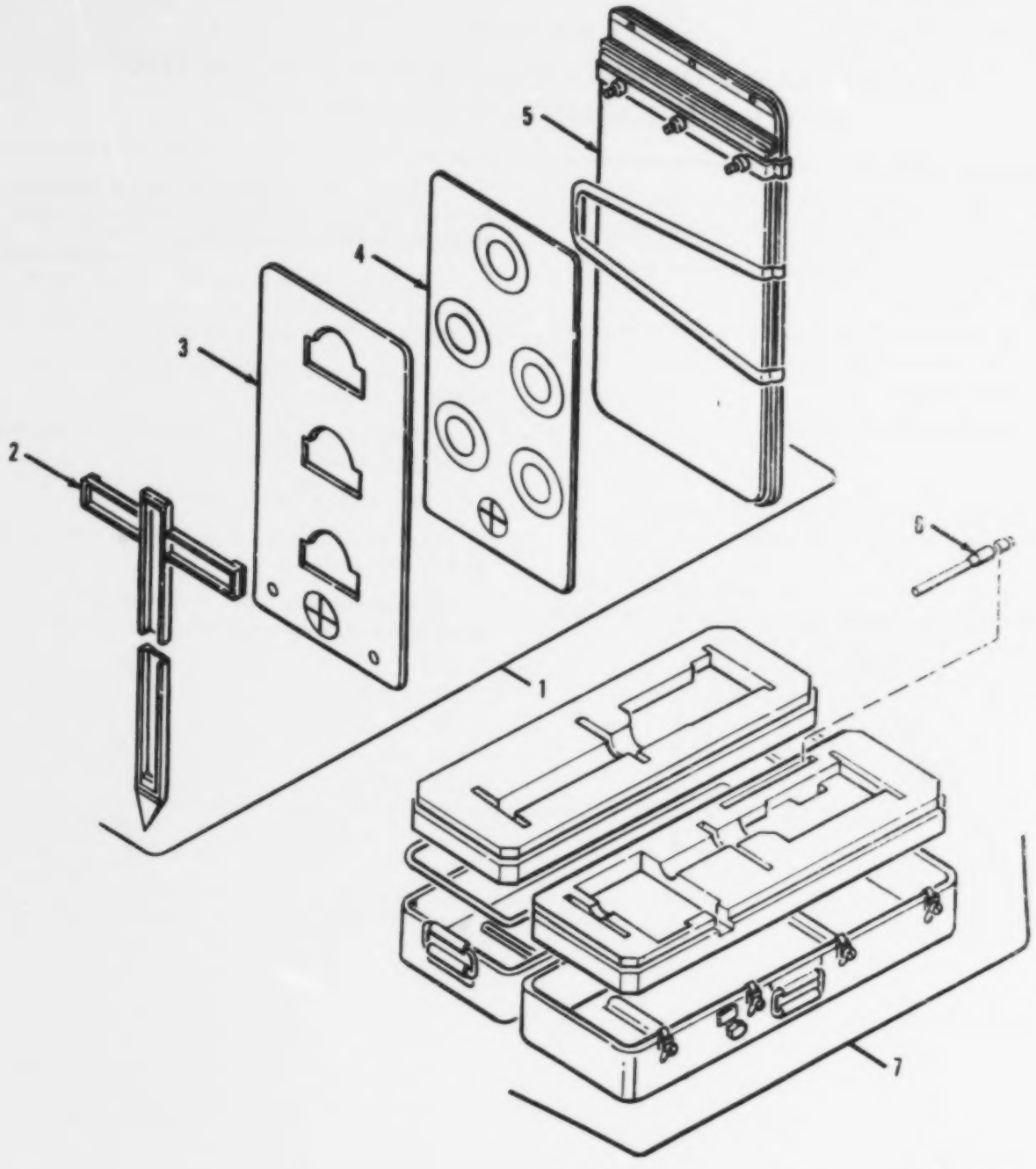
(4) Replace any target that is badly bent, deformed, or corroded.

c. *Target Carrying Case.* Replace target carrying case (5, fig 6-1) when badly worn.

6-3. **Laser Carrying Case (7, Fig 6-1).**

a. *Barrel Extension.* Replace barrel extension (6, fig 6-1) when worn.

b. *Laser Carrying Case.* Replace laser carrying case (7) when completely unserviceable.



Legend for fig 6-1.

1. Laser target set - 10554641
2. Frame assembly - 11743787
3. Retroreflective type II target - 11739878
4. Retroreflective type I target - 11739877
5. Target carrying case - 11743777
6. Barrel extension - 11741689
7. Laser carrying case - 11743778

Figure 6-1. Auxiliary equipment

CHAPTER 7
FINAL INSPECTION

7-1. **General.** This chapter contains procedures for assuring that the laser and ADFT meet the operating standards given in TM 9-6920-357-10-1 and TM 9-6920-357-10-2. Performing these procedures will restore the laser and ADFT to a completely serviceable condition for return to the user or to stock.

7-2. **Final Inspection and Test.**

a. *Inspection.* Perform the inspection procedures given in table 7-1.

b. *Installation.* The instructions for installing the laser in the vehicle and on the various howitzers are given in TM 9-6920-357-10-1 and TM 9-6920-357-10-2.

c. *Final Test.*

NOTE

Before starting these procedures be sure the protective dust cap (1, fig 4-1) is removed from the front of the barrel assembly.

Table 7-1. Final Inspection

Inspect	For
Solder joints	Cold solder joints
	Excessive solder
Wiring	Frayed, broken, or burned insulation
	Pinched or broken leads
	Disconnected leads
Receptacle	Insecure mounting, damaged shell
Test point connectors	Insecure mounting, damaged shell
	Bent or missing pin
	Damaged wiring to connector
Plug-in modules	Breaks, cracks, or loose terminals
	Insecure mounting
Resistors	Cracked resistor or broken lead
	Discoloration or bulging due to overheating
	Insecure mounting
Capacitors	Bulging or melted wax
	Insecure mounting
Diodes or transistors	Cracks, discoloration, broken leads, or insecure mounting
Transformers	Leaking tar or wax, or signs of overheating Damaged or broken connector Insecure mounting

Table 7-1. Final Inspection - Continued

Inspect	For
Lamps and sockets	Missing or burned-out lamp
	Damaged socket
	Damaged or missing lenses
	Insecure mounting
Toggle switches	Damaged connections
	Insecure mounting
	Improper switching action
Plasma tube	Cracks, dust, or dirt
EMI gasket and O-rings	Cracks or deterioration
Lens assembly	Cracks, dust, or dirt
Nameplates, warning plates, and instruction plates	Missing or damaged
	Legibility
	Insecure mounting
Painted surfaces	Nicks, scratches, or gouges
Shafts	Straightness, free turning
Scales	Legibility, slipping action
Windows	Moisture, cracks, dust, or dirt
Thumbscrew and pad	Free movement
Targets	Surface condition and legibility
Deflection tables	Legibility
Carrying cases	Cracks, dents, missing hardware, dust, and dirt

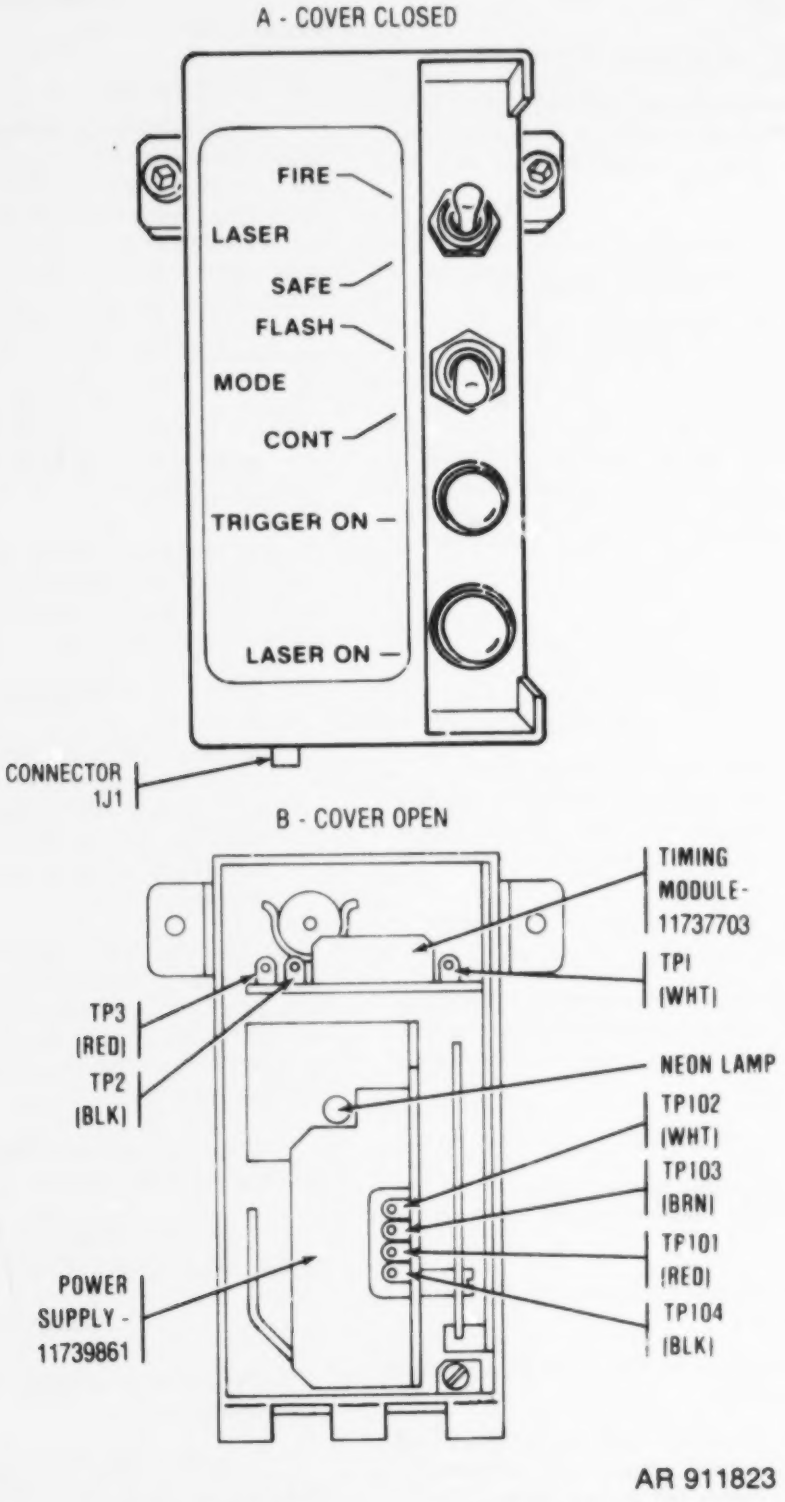


Figure 7-1. Laser rear cover control panel

(1) Bench test.

WARNING

Make sure the laser LASER SAFE FIRE circuit breaker switch (located on the rear cover control panel of the laser, figure 7-1) is placed on SAFE.

NOTE

A delay of up to 30 seconds and possibly up to 30 minutes may be experienced when power is initially applied to the laser or after any rest period of three minutes or longer.

(a) Test points located on the modules are indicated in figure 7-1. TP103 provides an output voltage which is proportional to the output high voltage at a ratio of 1000:1. The tests points are physically color coded as follows:

TP1 - White	TP101 - Red
TP2 - Black	TP102 - White
TP3 - Red	TP103 - Brown
	TP104 - Black

(b) Connect a +24 vdc power supply between 1J1 of the laser and ground. (The mounting surface on the barrel assembly may be used for the ground return.) Observe that the laser TRIGGER ON lamp illuminates.

(c) Place the laser MODE FLASH CONT switch in the CONT position.

(d) Place the laser LASER SAFE FIRE circuit breaker switch in the FIRE position. Observe that the laser LASER ON lamp illuminates and the laser emits continuous laser light.

WARNING

Avoid looking directly into the laser beam as this may cause permanent eye damage.

(e) Place the laser LASER SAFE FIRE circuit breaker switch in SAFE.

(f) Place the laser MODE CONT FLASH switch in the FLASH position.

(g) Place the laser LASER SAFE FIRE circuit breaker in the fire position. Observe that the laser LASER ON lamp flashes and the laser emits a short burst of laser light.

(h) Place the laser LASER SAFE FIRE circuit breaker switch in SAFE.

(2) Vehicle test.

(a) Refer to the applicable vehicle operator's manual (M60 and M60A1 tanks, TM 9-2350-215-10; M60A2 tank, TM 9-2350-232-10; M48A3 tank, TM 9-2350-224-10; M551 assault vehicle, TM 9-2350-230-10-2-1; M551A1 assault vehicle w/laser range finder, TM 9-2350-230-10-2-3) for the proper placement of all vehicle controls necessary to fire coax machine gun. Refer to TM 9-6920-357-10-1 (LASER Gunnery trainer M55) for necessary 24vdc power connection.

NOTE

Make sure the vehicle MASTER SWITCH is turned on.

(b) Place the vehicle TURRET POWER switch (TURRET CONTROL switch on the M551 assault vehicle) in the ON position. Observe that the corresponding indicator lamp illuminates.

WARNING

Make sure the laser LASER SAFE FIRE circuit breaker switch (located on the rear cover control panel of the laser) is placed on SAFE, and the TRIGGER ON indicator lamp is extinguished before proceeding to step (c).

(c) Place the vehicle MACHINE GUN switch in the ON position (ARMAMENT switch on the M60A2 tank in the COAX position and FIRE CONTROL switch on the M551 or M551A1 assault vehicle to the COAX position). Observe that the corresponding vehicle indicator lamp illuminates.

(d) Place the laser MODE FLASH CONT switch in the CONT position.

(e) Place the laser LASER SAFE FIRE circuit breaker switch in the FIRE position.

WARNING

Observe all range safety regulations during operation.

(f) Press the vehicle gunner's or commander's firing trigger until the laser LASER ON lamp illuminates. Observe that a beam of laser light is emitted.

WARNING

Avoid looking directly into the laser light; this may cause permanent eye damage.

NOTE

A delay of up to 30 seconds and possibly up to 30 minutes may be experienced when the laser is turned on for the first time following installation or for the first time following any rest period of three minutes or longer. The vehicle's firing trigger must be pressed continuously until the LASER ON lamp illuminates.

(g) Release the vehicle's firing trigger and place the laser MODE CONT FLASH switch in the FLASH position.

(h) Press the vehicle's firing trigger intermittently and observe that the laser TRIGGER ON and LASER ON lamps illuminate each time the firing trigger is pressed. Also observe short flashes of laser light each time the firing trigger is pressed.

(i) Place the laser LASER SAFE FIRE circuit breaker switch in the SAFE position.

(3) Howitzer test.

For installation, checkout, and operation of laser and ADFT on applicable howitzer, refer to the appropriate section of TM 9-6920-357-10-2.

APPENDIX A

REFERENCES

A-1. **TECHNICAL MANUALS.** The following technical manuals are applicable to this publication.

TM 38-750	The Army Maintenance Management System (TAMMS)
TM 43-0139	Painting Instructions for Field Use
TM 740-90-1	Administrative Storage of Equipment
TM 750-116	Organizational, Direct Support, and General Support Maintenance Procedures for Purging and Charging of Fire Control Instruments
TM 9-1015-203-12	Operator Crew and Organizational Maintenance Manual for Howitzer, Light, Towed: 105-mm, M101 (1015-322-9728) and M101A1 (1015-322-9752)
TM 9-1015-234-12	Operator and Organizational Maintenance Manual: Howitzer, Light, Towed: 105-mm, M102 (1015-086-8164)
TM 9-1025-200-12	Operator's and Organizational Maintenance Manual: Howitzer, Medium, Towed: 155-mm, M114 and M114A1
TM 9-1025-211-10	Operator's Manual: Howitzer, Medium, Towed: 155-mm, M198
TM 9-2350-257-10-2	Operator's Manual, Tank Combat: Full Track, M60A1 (RISE)
TM 9-2350-215-10	Tank, Combat, Full Tracked: 105-mm Gun, M60A1 W/E (2350-00-756-8497) Tank, Combat, Full Tracked: 105-mm Gun, M60 W/E (2350-00-678-5773)
TM 9-2350-217-10N	Operation and Maintenance Manual: (Crew) Howitzer, Medium, Self-Propelled: 155-mm, M109 (2350-00-440-8811) and 155-mm, M109A1 (2350-00-485-9662)
TM 9-2350-224-10	Operator's Manual: Tank, Combat, Full Tracked: 90-mm Gun, M48A3 W/E (2350-00-895-9154)
TM 9-2350-230-10	Operator's Manual (Crew) for Armored Reconnaissance/Airborne Assault Vehicle, Full Tracked, 152-mm Gun/Launcher M551 (2350-00-873-5408) and M551A1 (2350-00-140-5151) (Sheridan)

TM 9-2350-232-10	Operator's Manual: Tank, Combat Full Tracked: 152-mm Gun/Launcher, M60A2, W/E (2350-00-930-3590)
TM 9-6920-357-10-1	Operator's Manual: Laser, Gunnery Trainer M55
TM 9-6920-357-10-2	Operator's Manual: Laser, Gunnery Trainer, M55 and Trainer, Field Artillery Direct Fire (w/o Laser)

A-2. **Other Publications.** The following publications are related to information contained in the manual.

AR 55-38	Reporting of Transportation Discrepancies in Shipments
AR 700-42	Classification, Reclassification, Maintenance, Issuance and Reporting of Maintenance Training Aircraft
AR 700-58	Packaging Improvement Report
MIL-STD-1275	Electrical Circuit, 28-Volt DC Transient Characteristics for Military Vehicles
MIL-STD-461A	Electromagnetic Interference Characteristic Requirements for Equipment
SC 4931-95-CL-A07	Shop Set, Instrument and Fire Control: Field Maintenance, Basic, Less Power
SC 4931-95-CL-A09	Tool Kit, Fire Control Instrument Repairman
SC 4931-95-CL-J54	Purging Kit, Fire Control: Organizational, Direct and General Support Maintenance
TB-MED-279	Control of Hazards to Health from Laser Radiation

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. **General.**

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item of component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. **Maintenance Functions.**

a. *Inspect.* To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. *Test.* **To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.**

c. *Service.* **Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.**

d. *Adjust.* To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. *Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

f. *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. *Install.* The act of emplacing, seating, or fixing into position an item, part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. *Replace.* The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. *Repair.* The application of maintenance services[1] or other maintenance actions[2] to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. *Overhaul.* That maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

[1]Services - inspect, test, service, adjust align, calibrate, or replace.

[2]Action - welding, grinding, riveting, straightening, facing, remachining, or resurfacing.

k. *Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc) considered in classifying Army equipments/components.

B-3. Explanation of Columns in the MAC, Section II.

a. *Column 1, Group Number.* Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. *Column 2, Component/Assembly.* Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. *Column 3, Maintenance Functions.* Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see para B-2).

d. *Column 4, Maintenance Level.* Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate "work time" figures will be shown for each level. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C	Operator or crew.
O	Organization maintenance.
F	Direct support maintenance.
H	General support maintenance.
D	Depot maintenance.

e. *Column 5, Tools and Equipment.* Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. *Column 6, Remarks.* This column shall, when applicable, contain a letter code, in alphabetical order, which shall be keyed to the remarks contained in section IV.

B-4. Explanation of Columns in Tool and Test Equipment Requirements, Section III.

a. *Column 1, Reference Code.* The tool and TMDE reference code correlates with a code in the MAC, section II, column 5.

b. *Column 2, Maintenance Level.* The lowest level of maintenance authorized to use the tool or test equipment.

c. *Column 3, Nomenclature.* Name or identification of the tool or test equipment.

d. *Column 4, National Stock Number.* The National stock number of the tool or TMDE.

e. *Column 5, Tool Part Number.* The manufacturer's part number.

B-5. Explanation of Columns in Remarks, Section IV.

a. *Reference Code.* The code recorded in column 6, section II.

b. *Remarks.* This column lists information pertinent to the maintenance function being performed as indicated in the MAC, section II.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
00	LASER GUNNERY TRAINER: M55 W/E 10554640								
01	GUNNERY TRAINER LASER 11741700	Inspect	0.1						
		Test	0.2						
		Service	0.2						
		Install	0.2						
		Replace			0.3			1,2	
		Repair			1.0			2,3	
		Overhaul					20	2,4-14	
0101	Barrel Assembly 11741701	Inspect	0.1						
		Service		0.2				4,5	
		Replace			0.4			1	
		Repair			1.0			1,3	
		Overhaul					4	4,5	
010101	Cell Assembly 11741680	Inspect	0.1						
		Service		0.2					
		Replace			0.2		0.5	1	A
0102	Electronic Components 11737724	Inspect	0.1						
		Service		0.2					
		Replace			0.4			1	
		Repair			1.0			1	
		Overhaul					4	2, 6-9	
010201	Circuit Card Assembly (Timing Module)	Inspect			0.2				
		Test			0.3			2,3	
		Replace			0.4			1	
		Overhaul					4	2, 6-9	
010202	Power Supply 11739861	Inspect			0.2				
		Test			0.4			2,3	
		Replace			0.4			1	
		Overhaul					4	2, 6-9	

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
010203	Chassis Assembly 11737760	Overhaul					3	7,8	
010204	Filter Housing Assembly 11737725	Overhaul					2	7,8	
010205	Enclosure Assembly 11737787	Overhaul					2		
02	CARRYING CASE 11743778	Inspect	0.1						
		Service	0.2						
		Replace			0.4				
		Repair			1.0			3	
1000	FIELD ARTILLERY DIRECT FIRE TRAINER 11746409								
1001	CARRYING CASE 11747158	Inspect	0.2						
		Service	0.2						
		Replace			0.4				
		Repair			2.0			1,3	
1002	DEFLECTOR OPTICAL ASSEMBLY 11746410	Inspect	0.2						
		Test	0.2						
		Service	0.2						
		Install	0.4						
		Replace			0.1				
		Repair			2.0			1,3	
		Overhaul					20	4,5,7,8, 11,13,14	

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
100201	Control Box Assembly 11746456	Replace			0.2			1,3	
		Repair			1.0			1,3	
		Overhaul					4	7,8	
100202	Deflector Assembly 11746421	Service		0.2				4,5	
		Replace			0.2		0.1	1,3	
		Repair			0.5			1,3	
		Overhaul					12	4,5,11 13,14	
1003	DISTRIBUTION BOX 11746450	Inspect	0.2						
		Service	0.2						
		Install	0.2						
		Replace			0.1				
		Repair			0.2			1	
		Overhaul					8	7,8	
1004	CABLE ASSEMBLY (20 FT) 11746452	Inspect	0.1						
		Service	0.2						
		Install	0.1						
		Replace			0.1				
		Repair			0.5			3	
1005	CABLE ASSEMBLY (10FT) 11746454	Inspect	0.1						
		Service	0.2						
		Install	0.1						
		Replace			0.1			3	
		Repair		0.1	0.5			1,3	B

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
1006	LANYARD SWITCH	Inspect	0.2						
	11746480	Service	0.2						
		Install	0.2						
		Replace			0.2				
		Repair			0.5			3	
1007	ADAPTER ASSEMBLY	Inspect	0.1						
	(M114A1/M114A2)	Service	0.1						
	11747146	Install	0.1						
		Replace			0.1				
		Repair			0.5			1,3	
		Overhaul						8	
1008	MOUNT ASSEMBLY	Inspect	0.1						
	11747147	Service	0.2						
		Install	0.2						
		Replace			0.1				
		Repair			0.3			1,3	
		Overhaul					12		
100801	Mount	Install	0.1						C
	11746495	Replace			0.1			1	
		Repair			0.4			1,3	
		Overhaul					4		
100802	Clamp	Replace			0.1				
	11746491	Overhaul					4		

(1) Group Number	(2) Component/Assembly	(3) Maintenance function	(4) Maintenance level					(5) Tools and equipment	(6) Remarks
			C	O	F	H	D		
1009	ADAPTER CABLE ASSEMBLY 11747152	Inspect	0.1						
		Service	0.1						
		Install	0.1						
		Replace			0.1				
		Repair			0.5			3	
1010	CABLE ASSEMBLY (M109 Power) 11747170	Inspect	0.1						
		Service	0.2						
		Install	0.2						
		Replace			0.1				
		Repair			0.5			3	
1011	BASE ASSEMBLY 11746509	Inspect	0.1						
		Service	0.1						
		Install	0.1						
		Replace			0.1				
		Overhaul					2		
1012	SUPPORT ASSEMBLY 11746502	Inspect	0.1						
		Service	0.1						
		Install	0.4						D
		Replace			0.1				
		Repair			0.2			1	
		Overhaul					2.0		

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Reference code	(2) Maintenance level	(3) Nomenclature	(4) National stock number	(5) Tool Part number
1	F	Tool Kit, Fire Control Instrument Repairman, SC 4931-95-CL-A09	4931-00-947-8243	
2	F,D	Power Supply DC (Power Design 3240 TE # 4808-0068 or equivalent)	Being Processed	11738233
3	F	Shop Set, Instrument and Fire Control Maintenance Basic, SC 4931-95-CL-A07	4931-00-754-0740	
4	O, F, D	Nitrogen, Technical (Tank)	6830-00-782-2641	
5	O, F, D	Purging Kit, Fire Control, SC 4931-95-CL-J54	4931-00-065-1110	
6	D	Oscilloscope	6625-00-127-0079	
7	D	Electrostatic Voltmeter (Sensitive Research Corp. ESHTE # 8909-0157-1 or equivalent)	Unassigned	
8	D	Volt-ohm Milliammeter (Simpson 260 or equivalent)	Unassigned	
9	D	Tester (Under development)	Unassigned	
10	D	Final Test Fixture for Laser Trainer M55 or equal		11739405
11	D	Fixture Collimation and Focus, or equal		11739406

(1) Reference code	(2) Maintenance level	(3) Nomenclature	(4) National stock number	(5) Tool Part number
12	D	Calibration Standard or equal		11739407
13	D	Collimator Telescope	1290-00-554-9108	554108
14	D	Collimator Projector	4931-00-757-3291	7573291

Section IV. REMARKS

Reference code	Remarks
A	DS replace preformed packing (para 4-2C).
B	Organizational replace fuse (para 5-5).
C	Reference TM 9-6920-357-10-2 for installation on adapter assembly (1007).
D	Reference TM 9-6920-35-10-2 for installation instructions.

APPENDIX C
ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (INCLUDING DEPOT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS)

Section I. INTRODUCTION

C-1. **Scope.** This appendix lists spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of organizational, direct support, and general support maintenance of the laser and ADFT. It authorizes the requisitioning and issue of spares and repair parts as indicated by the source and maintenance codes.

C-2. **General.** This Repair Parts and Special Tools List is divided into the following sections:

a. *Section II. Repair Parts List.* A list of spares and repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in numeric sequence, with the parts in each group listed in figure and item number sequence. Bulk materials are listed in NSN sequence.

b. *Section III. Special Tools List.* A list of special tools, special TMDE, and other special support equipment authorized for the performance of maintenance.

c. *Section IV. National Stock Number and Part Number Index.* A list, in National Item Identification Number (NIIN) sequence, of all National stock numbers (NSN) appearing in the listings, followed by a list in alphameric sequence of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance. This index is followed by a cross-reference list of reference designators to figure and item numbers.

C-3. **Explanation of Columns.**

a. *Illustration.* This column is divided as follows:

(1) *Figure Number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item Number.* The number used to identify item called out in the illustration.

b. *Source, Maintenance, and Recoverability (SMR) Codes.*

(1) *Source Code.* Source codes indicate the manner of acquiring support items for maintenance repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code	*Definition*
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply system.
PC	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later time.

Code	*Definition*
KD	An item of a depot overhaul/repair kit and not purchased separately. Depot kit defined as a kit that provides items required at the time of overhaul or repair.
KF	An item of a maintenance kit and not purchased separately. Maintenance kit defined as a kit that provides an item that can be replaced at organizational or intermediate levels of maintenance.
KB	Item included in both a depot overhaul /repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at the direct support maintenance level.
MH	Item to be manufactured or fabricated at the general support maintenance level.
MD	Item to be manufactured or fabricated at the depot maintenance level.
AO	Item to be assembled at organizational level.
AF	Item to be assembled at direct support maintenance level.
AH	Item to be assembled at general support maintenance level.
AD	Item to be assembled at depot maintenance level.
XA	Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.
XB	Item is not procured or stocked. If not available through salvage, requisition.
XC	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD	A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA and aircraft support items as restricted by AR 700-42.

(2) *Maintenance Code.* Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

Code	*Application/Explanation*
C	Crew or operator maintenance performed within organizational maintenance.
O	Support item is removed, replaced, used at the organizational level.
F	Support item is removed, replaced, used at the direct support level.
H	Support item is removed, replaced, used at the general support level.
D	Support items that are removed, replaced, used at depot, mobile depot, or specialized repair activity only.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes.

Code	*Application/Explanation*
O	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H	The lowest maintenance level capable of complete repair of the support item is the general support level.
D	The lowest maintenance level capable of complete repair of the support item is the depot level.
L	Repair restricted to Specialized Repair Activity.

Code	*Application/Explanation*
Z	Nonreparable. No repair is authorized.
B	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc, at the user level. No parts or special tools are procured for the maintenance of this item.

(3) *Recoverability Code.* Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverability Codes	*Definition*
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
O	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.
F	Reparable item. When uneconomically reparable, condemn and dispose at the direct support level.
H	Reparable item. When uneconomically reparable, condemn and dispose at the general support level.
D	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
L	Reparable item. Repair, condemnation, and disposal not authorized below depot specialized repair activity level.
A	Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. *National Stock Number.* Indicates the National stock number assigned to the item and which will be used for requisitioning.

d. *Part Number.* Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

NOTE

When a stock numbered item is requisitioned, the item received may have a different part number than the part being replaced.

e. *Federal Supply Code for Manufacturer (FSCM).* The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. *Description.* Indicates the Federal item name and, if required, a minimum description to identify the item. In the Special Tools List, the initial basis of issue (BOI) appears as the last line in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased accordingly.

g. *Unit of Measure (U/M).* Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr, etc). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. *Quantity Incorporated in Unit.* Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, (e.g., shims, spacers, etc).

C-4. **Special Information.** Usable on codes are shown in the description column. Uncoded items are applicable to all models. Identification of the usable codes used in this publication are:

Code	Used On
A30	Trainer, Laser Gunnery M55
F59	Trainer, Field Artillery: Direct Fire

C-5. **How to Locate Repair Parts.**

a. *When National Stock Number or Part Number is Unknown:*

(1) *First.* Using the table of contents, determine the functional group within which the item belongs. This is necessary since illustrations are prepared for functional groups and listings are divided into the same groups.

(2) *Second.* Find the illustration covering the functional group to which the item belongs.

(3) *Third.* Identify the item on the illustration and note the illustration figure and item number of the item.

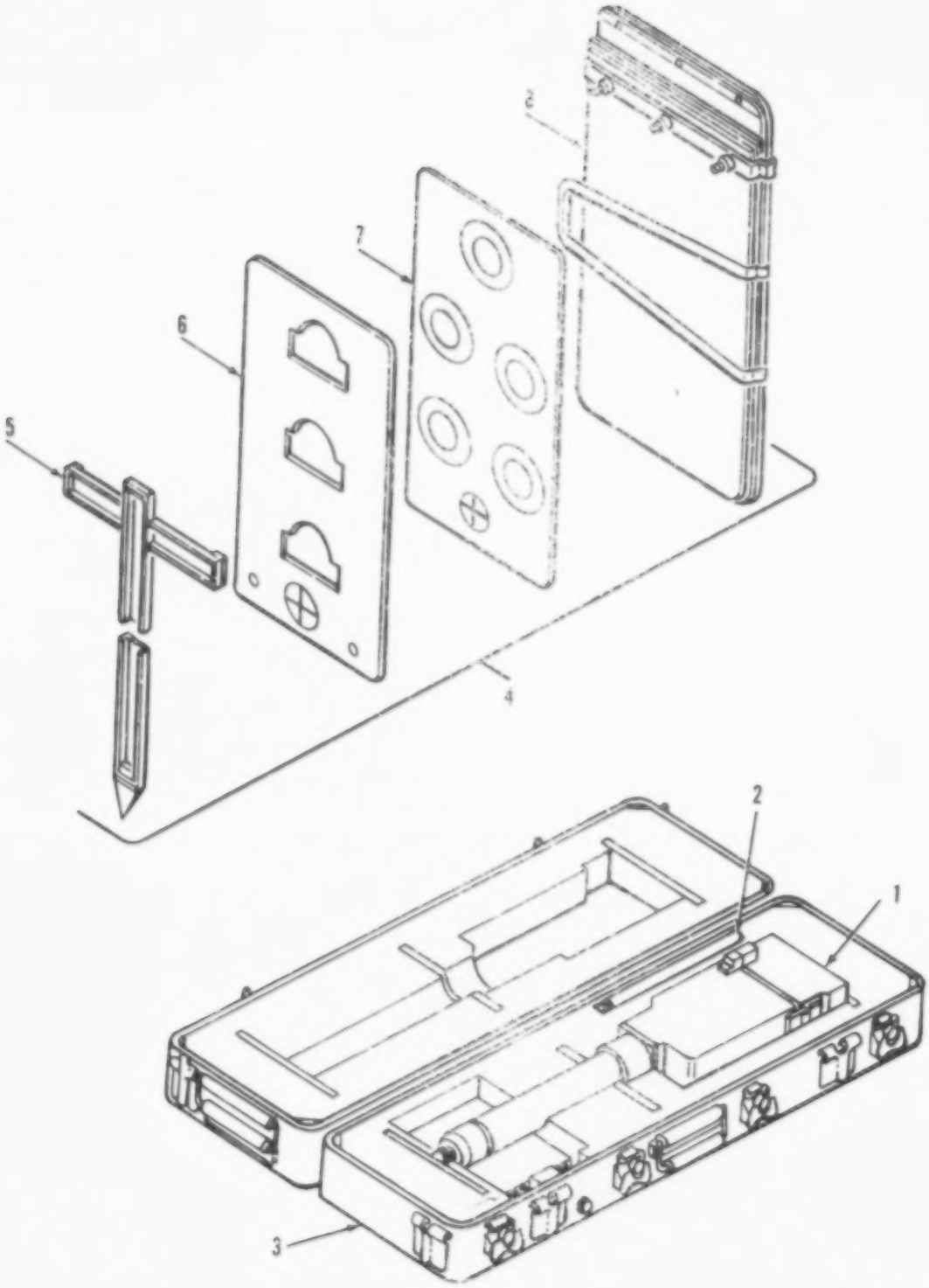
(4) *Fourth.* Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. *When National Stock Number or Part Number is Known:*

(1) *First.* Using the Index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. This index i in NIIN sequence followed by a list of part numbers in alphameric sequence, cross-referenced to the illustration figure number and item number.

(2) *Second.* After finding the figure and item number, locate the figure and item number in the repair parts list.

C-6. **Abbreviations.** None.



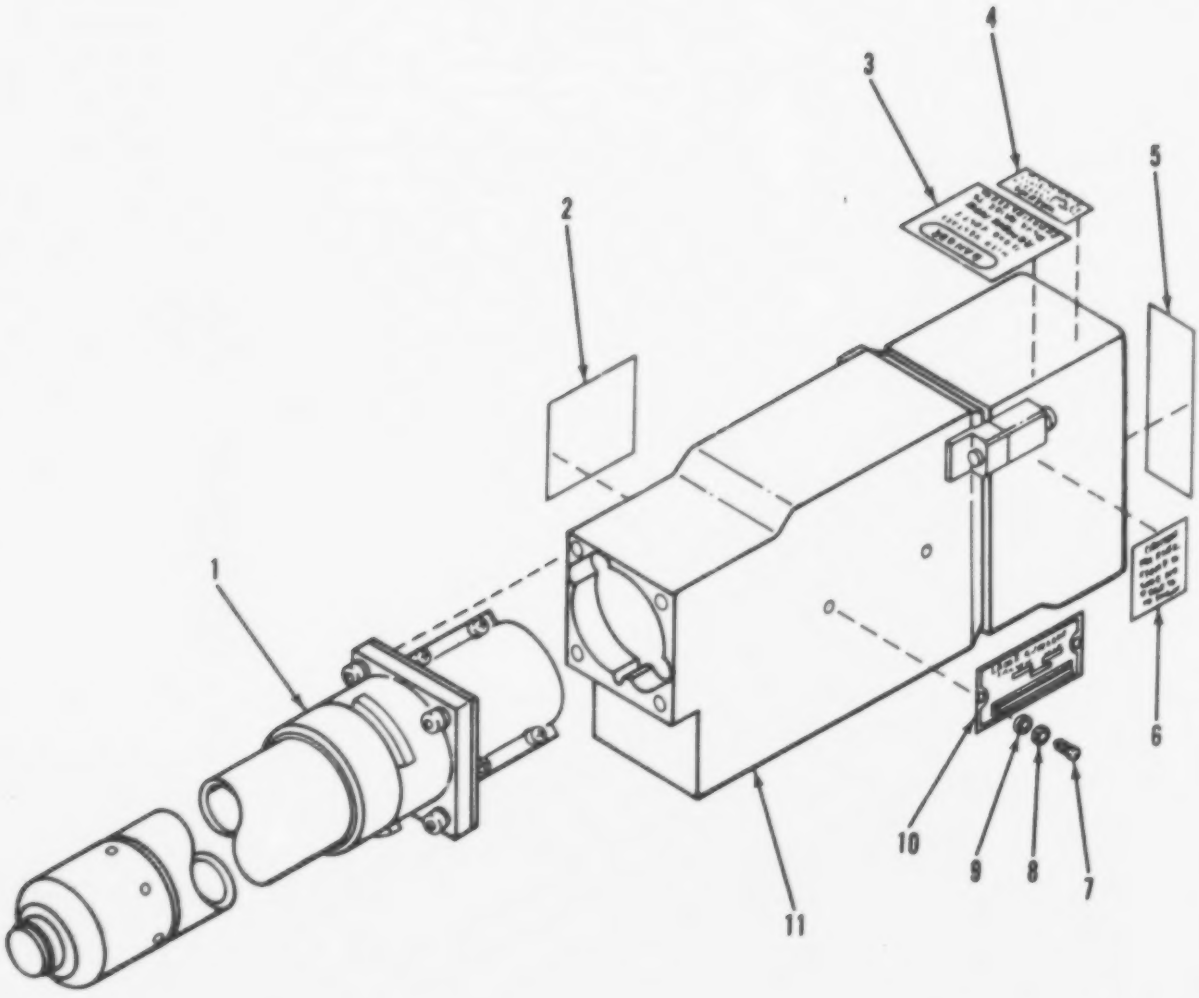
AR 911855

Figure C-1. Laser gunnery trainer: M55 w/e

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION (USABLE ON CODE)	(7) U/M	(8) QTY INC IN UNIT
						GROUP 00 LASER GUNNERY TRAINER:M55 W/E		
						10554640		
C-1	1	AAOFD		11741700	19200	LASER, GUNNERY.....A30	EA	1
C-1	2	PDOZZ	6920-01-026-3221	11741689	19200	BARREL, EXTENSION.....A30	EA	1
C-1	3	PDFDL	6920-01-031-9046	11743778	19200	CASE, CARRYING, LASER.....A30	EA	1
C-1	4	PDFDL	6920-01-032-0279	10554641	19200	TARGET SET, LASER.....A30	EA	1
C-1	5	PAPZZ	6920-01-026-2971	11743787	19200	FRAME ASSEMBLY.....A30	EA	1
C-1	6	PAPZZ	6920-01-026-4581	11739879	19200	TARGET, RETROREFLECTIVE TYPE II.....A30	EA	1
C-1	7	PAPZZ	6920-01-026-9182	11739877	19200	TARGET, RETROREFLECTIVE TYPE I.....A30	EA	1
C-1	8	PDFZZ	6920-01-026-6577	11743777	19200	CASE, CARRYING, TARGET.....A30	EA	1



AR 911824

Figure C-2. Gunnery trainer laser

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 01 GUNNERY TRAINER LASER		
						1▲741700		
C-2	1	XDFDL	6920-00-251-7523	11741701	19200	BARREL ASSEMBLY.....A30	EA	1
C-2	2	PAFZZ	7690-01-027-3395	11741698	19200	MARKER, IDENTIFICATION.....A30	EA	1
C-2	3	PAFZZ	7690-01-039-1444	11741691	19200	MARKER, IDENTIFICATION.....A30	EA	1
C-2	4	PAFZZ	7690-01-043-0606	11741693	19200	MARKER, IDENTIFICATION.....A30	EA	1
C-2	5	PAFZZ	7690-01-038-5515	11741695	19200	MARKER, IDENTIFICATION.....A30	EA	1
C-2	6	PAFZZ		10556212	19200	PLATE, INSTRUCTION.....A30	EA	1
C-2	7	PAFZZ	5305-00-057-0497	MS51958-1	96906	SCREW, MACHINE.....A30	EA	2
C-2	8	PAFZZ	5310-00-543-4652	MS35333-69	96906	WASHER, LOCK.....A30	EA	2
C-2	9	PAFZZ	5310-00-595-6761	MS15795-802	96906	WASHER, FLAT.....A30	EA	2
C-2	10	XDFZZ		11741692	19200	PLATE, IDENTIFICATION.....A30	EA	1
C-2	11	XCFDL	6920-00-248-2578	11737724	19200	ELECTRONIC COMPONENTS.....A30	AY	1

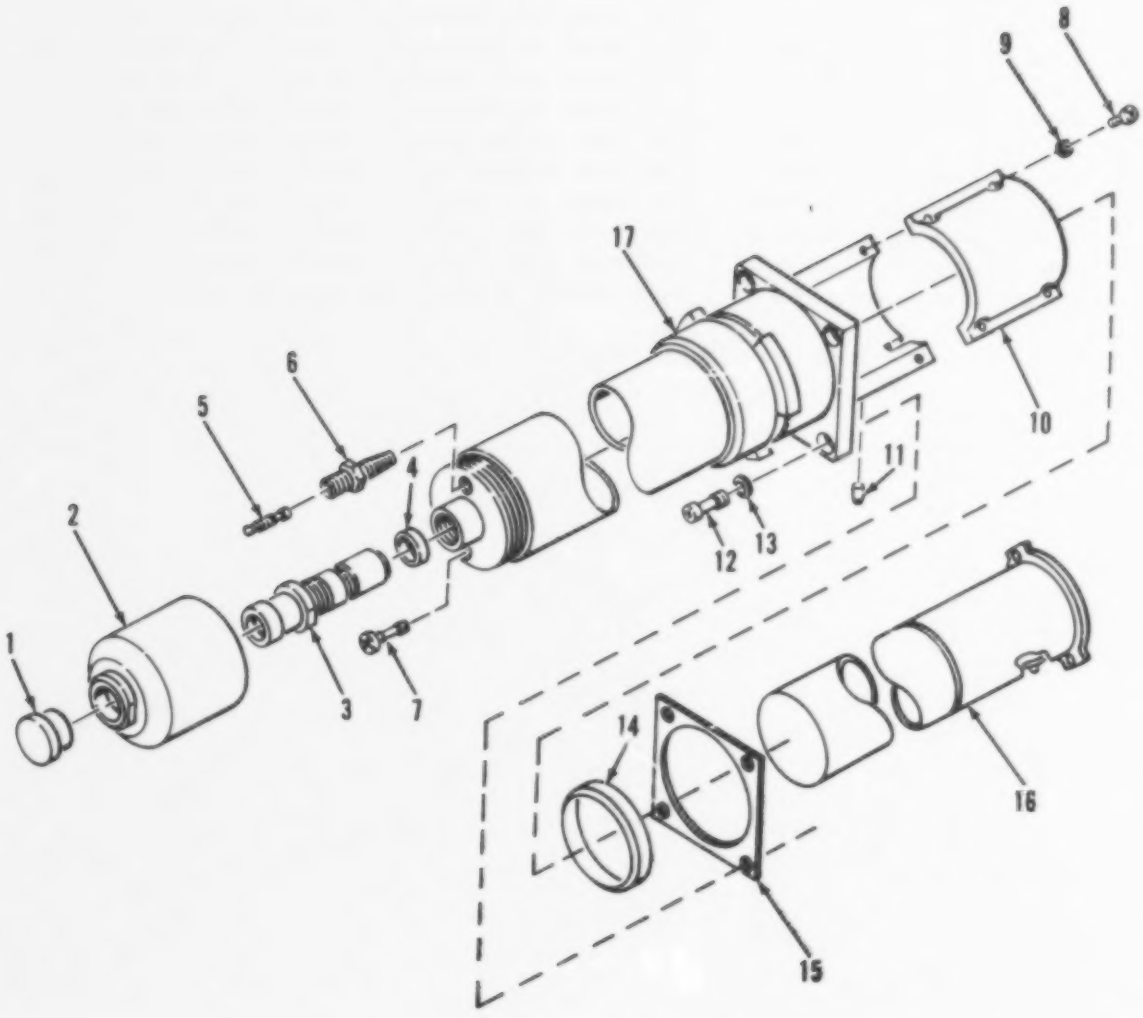
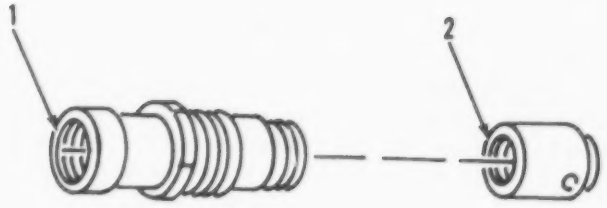


Figure C-3. Barrel assembly

SECTION II

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 0101 BARREL ASSEMBLY		
						11741701		
C-3	1	PAOZZ	5340-00-682-2474	MS25178-10	96906	CAP, PROTECTIVE, DUST.....A30	EA	1
C-3	2	PAOZZ	6920-00-251-7598	11741679	19200	GUARD, LENS.....A30	EA	1
C-3	3	PAOOL	6920-00-251-7509	11741680	19200	CELL ASSEMBLY, OPTICAL.....A30	EA	1
C-3	4	PAFZZ	5330-00-580-2275	MS9021-114	96906	PACKING, PREFORMED (O-RING).....A30	EA	1
C-3	5	PAFZZ	2040-00-060-3543	MS51377-2	96906	VALVE, CORE.....A30	EA	1
C-3	6	PAFZZ	2640-00-114-1096	MS51607-1	96906	VALVE STEP, PURGING.....P30	EA	1
C-3	7	PAFZZ	5305-00-111-5540	11737718	19200	SCREW, MACHINE.....A30	EA	1
C-3	8	PAFZZ	5305-00-959-1082	MS16995-18	96906	SCREW, CAP, SOCKET HEAD.....A30	EA	4
C-3	9	PAFZZ	5310-00-529-6355	MS35338-136	96906	WASHER, LOCK.....A30	EA	4
C-3	10	PAFZZ	6920-00-251-7507	11741677	19200	CLAMP, TUBE.....A30	EA	1
C-3	11	PAFZZ	5315-00-262-1644	11737742	19200	PIN, STRAIGHT, HEADLESS.....A30	EA	1
C-3	12	PAFZZ	5306-00-111-5542	11737733	19200	BOLT, INTERNAL.....A30	EA	4
C-3	13	PAFZZ	5310-00-933-8123	MS35338-138	96906	WASHER, LOCK.....A30	EA	4
C-3	14	PAFZZ	5330-00-294-9715	MS9021-327	96906	PACKING, PREFORMED (O-RING).....A30	EA	1
C-3	15	PAFZZ	5999-00-349-6193	11737729	19200	SHIELDING GASKET LASER, PLASMA.....A30	EA	1
C-3	16	PAFZZ	6920-00-393-3268	11746797	19200	TUBE, LASER, PLASMA.....A30	EA	1
C-3	17	XDFZZ		11741676	19200	BARREL, GUN-LASER.....A30	EA	1



AR 911826

Figure C-4. Cell assembly

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 010101 CELL ASSEMBLY 11741680		
C-4	1	PADZZ	6920-00-251-7511	11741681	19200	CELL, ASSEMBLY, OPTICAL.....A30	EA	1
C-4	2	PADZZ	6920-00-251-7515	11741683	19200	CELL, ASSEMBLY, OPTICAL.....A30	EA	1

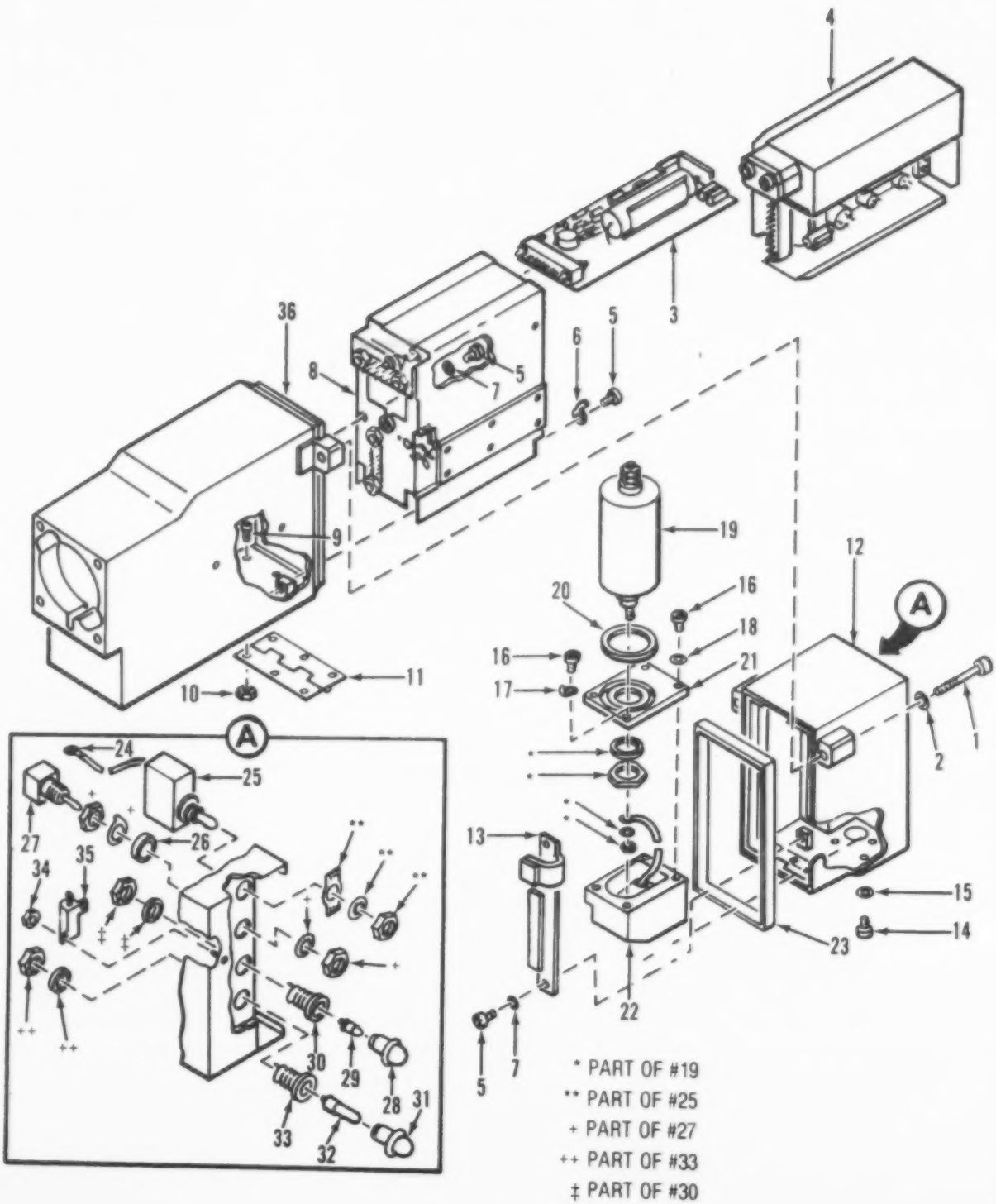


Figure C-5. Electronics components

(1) ILLUSTRATION (a) FIG NO	(b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 0102 ELECTRONIC COMPONENTS 11737724		
C-5	1	PAFZZ	6920-00-251-7527	11737792	19200	SCREW, SPECIAL.....A30	EA	2
C-5	2	PAFZZ	5310-00-933-8121	MS35338-139	96906	WASHER, LOCK.....A30	EA	2
C-5	3	PAFDL	6920-00-249-2572	11737703	19200	CIRCUIT CARD ASSEMBLY.....A30	EA	1
C-5	4	PAFDD	6920-00-260-6060	11739861	19200	POWER SUPPLY.....A30	EA	1
C-5	5	PAFZZ	5305-00-054-6652	MS51957-28	96906	SCREW, MACHINE.....A30	EA	6
C-5	6	PAFZZ	5940-00-827-2653	MS77068-2	96906	TERMINAL, LUG.....A30	EA	2
C-5	7	PAFZZ	5310-00-929-6395	MS35338-136	96906	WASHER, LOCK.....A30	HD	5
C-5	8	KDDDL		11737760	19200	CHASSIS ASSEMBLY.....A30	EA	1
C-5	9	PAFZZ	5305-00-738-0624	MS3212-1	96906	SCREW, MACHINE.....A30	EA	6
C-5	10	PAFZZ	5310-00-939-0849	MS21083C04	96906	NUT, SELF-LOCKING.....A30	EA	6
C-5	11	PAFZZ	6920-00-251-7518	11737780	19200	HINGE, CRES, 2.500 LG, 1 W.....A30	EA	1
C-5	12	KDDDL		11737768	19200	COVER, ENCLOSURE.....A30	EA	1
C-5	13	PAFZZ	6920-00-249-2583	11737759	19200	CLAMP ASSEMBLY.....A30	AY	1
C-5	14	PADZZ	5305-00-054-6668	MS51957-43	96906	SCREW, MACHINE.....A30	HD	3
C-5	15	PADZZ	5310-00-933-8119	MS35338-137	96906	WASHER, LOCK.....A30	HD	3
C-5	16	PADZZ	5305-00-068-5276	MS16995-9	96906	SCREW, CAP, SOCKET HEAD.....A30	EA	4
C-5	17	PADZZ	5940-00-682-2477	MS77068-1	96906	TERMINAL, LUG.....A30	PG	1
C-5	18	PADZZ	5310-00-933-8118	MS35338-135	96906	WASHER, LOCK, SPRING.....A30	HD	3
C-5	19	PADZZ	5915-00-506-4167	11737715	19200	FILTER, RADIO FREQUENCY.....A30	EA	1
C-5	20	PADZZ	5999-00-515-2068	11737797	19200	SHIELDING GASKET, ELECTRONIC.....A30	EA	4
C-5	21	XDDZZ		11737771	19200	COVER, HOUSING.....A30	EA	1
C-5	22	KDDDL		11737725	19200	HOUSING ASSEMBLY, FILTER.....A30	EA	1
C-5	23	PADZZ	5999-00-349-6194	11737791	19200	SHIELDING GASKET, ELECTRONIC.....A30	EA	1
C-5	24	PAFZZ	5940-00-143-4774	MS25036-153	96906	TERMINAL LUG.....A30	EA	1
C-5	25	PAFZZ	5925-00-836-6173	M39019-1-31	81349	CIRCUIT BREAKER.....A30	EA	1
C-5	26	PAFZZ	5330-00-806-8769	MS25196-1	96906	PACKING WITH RETAINER.....A30	EA	1
C-5	27	PAFZZ	5930-00-412-3990	MS27719-23	96906	SWITCH, TOGGLE.....A30	EA	1
C-5	28	PAFZZ	6210-00-487-3011	11737708-2	19200	LENS, LIGHT.....A30	EA	1
C-5	29	PAFZZ	6240-00-763-7744	MS18209-387	96906	LAMP, INCANDESCENT.....A30	EA	1
C-5	30	PAFZZ	6210-01-038-3727	11737726-1	19200	LIGHT, INDICATOR.....A30	EA	1
C-5	31	PAFZZ	6210-00-282-8906	11737708-3	19200	LENS, LIGHT.....A30	EA	1
C-5	32	PADZZ	6240-00-892-4420	MS25252C7A	96906	LAMP, GLOW.....A30	EA	1
C-5	33	PAFZZ	6210-00-319-8712	11737726-2	19200	LIGHT, INDICATOR.....A30	EA	1
C-5	34	PADZZ	5310-00-050-1823	MS21042-02	96906	NUT, SELF-LOCKING.....A30	EA	2
C-5	35	PADZZ	5905-00-496-4304	RER65F49R9P	81349	RESISTOR, FIXED, WIRE.....A30	EA	1
C-5	36	KDDDL		11737707	19200	ENCLOSURE ASSY.....A30	EA	1
C-5	37	MDDZZ				TWINE, IMPREGNATED.....A30	EA	1
C-5	38	MDDZZ				WIRE, ELECTRIC-E-14-R (MFG FROM MIL-W-16878/4).....A30	EA	1
C-5	39	MDDZZ				WIRE, ELECTRIC-22-B (MFG FROM MIL-W-16878/4).....A30	EA	1
C-5	40	MDDZZ				WIRE, ELECTRIC-22-R (MFG FROM MIL-W-16878/4).....A30	EA	1

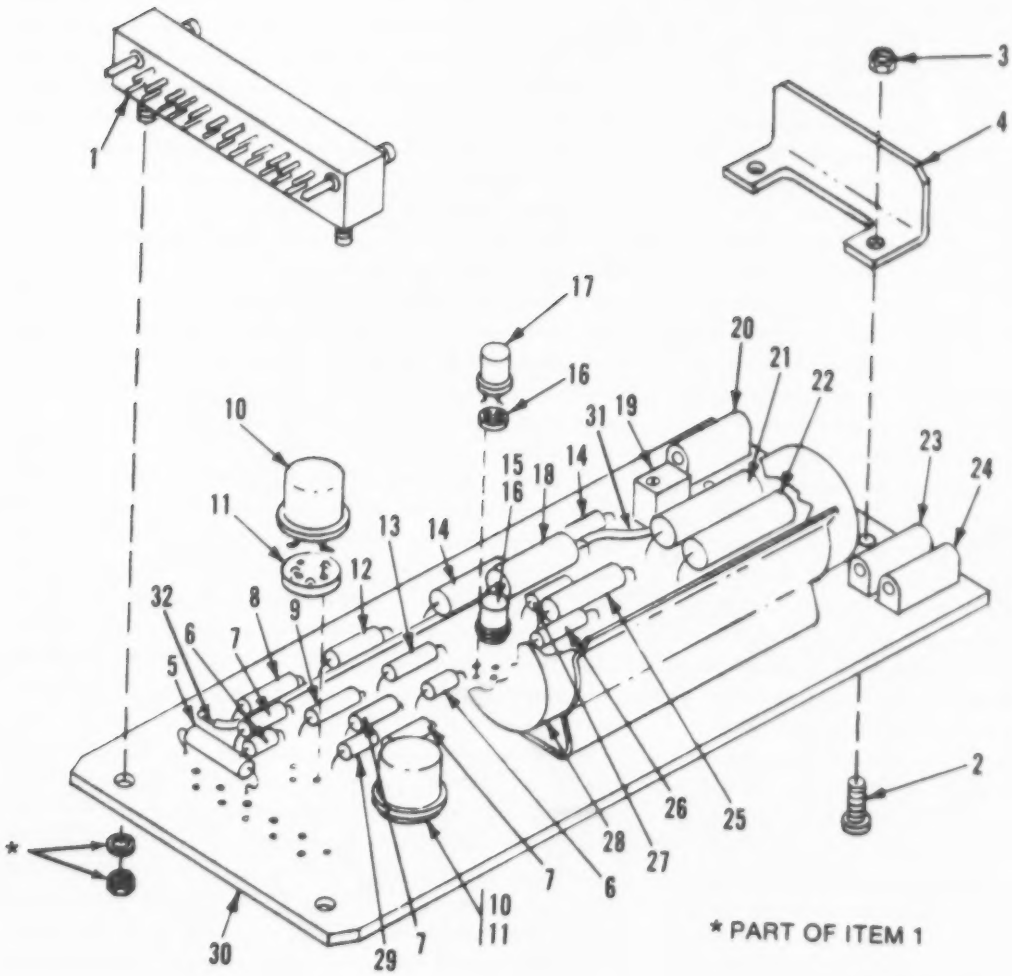


Figure C-6. Circuit card assembly (timing module)

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 010201 CIRCUIT CARD ASSEMBLY		
						11737703		
C-6	1	PAOZZ	6920-00-291-7919	11741695	19200	CONNECTOR.....A3J	EA	1
C-6	2	PAOZZ	9305-00-959-0379	MS16995-10	96906	SCREW, CAP, SOCKET HEAD.....A3J	EA	2
C-6	3	PAOZZ	9310-00-876-3292	MS21043-04	96906	NUT, SELF-LOCKING.....A3J	EA	2
C-6	4	XBOZZ		11737732	19200	BRACKET.....A3J	EA	4
C-6	5	PAOZZ		RNR60K7503FM	81349	RESISTOR, FIXED, FILM.....A3J	EA	1
C-6	6	PAOZZ	5910-00-111-4811	CK05BX103K	81349	CAPACITOR, FIXED.....A3J	EA	2
C-6	7	PAOZZ	5905-00-110-7422	RCR07G682JS	81349	RESISTOR, FIXED, COMPOSITION.....A3J	EA	3
C-6	8	PAOZZ	5961-00-883-1511	JAN1N9418	81349	SEMICONDUCTOR DEVICE.....A3J	EA	1
C-6	9	PAOZZ	5905-00-141-0717	RCR07G473JS	81349	RESISTOR, FIXED, COMPOSITION.....A3J	EA	1
C-6	10	PAOZZ	5961-00-559-8549	JAN2N1871A	81349	TRANSISTOR.....A3J	EA	2
C-6	11	PAOZZ	5999-00-713-0913	11737761	19200	TRANSISTOR SPACER.....A3J	EA	2
C-6	12	PAOZZ	5961-00-892-0734	JAN1N4838	81349	SEMICONDUCTOR DEVICE, DIODE.....A3J	EA	2
C-6	13	PAOZZ	5961-00-866-5454	JAN1N821	81349	SEMICONDUCTOR DEVICE, DIODE.....A3J	EA	1
C-6	14	PAOZZ	5905-00-417-7278	RLR20C162GR	81349	RESISTOR, FIXED, FILM.....A3J	EA	1
C-6	15	PAOZZ	5961-00-951-8797	JAN2N2222A	81349	TRANSISTOR.....A3J	EA	1
C-6	16	XBOZZ	5999-00-958-6759	1C540766	19200	MOUNTING PAD, ELECTRIC.....A3J	EA	2
C-6	17	PAOZZ	5961-00-911-6015	JAN2N3251A	81349	TRANSISTOR.....A3J	EA	1
C-6	18	PAOZZ	5910-00-069-0365	M39003-01-2358	81349	CAPACITOR, FIXED, ELECTRIC.....A3J	EA	1
C-6	19	PAOZZ	5905-00-212-3574	RJ26FW105	81349	RESISTOR, VARIABLE.....A3J	EA	1
C-6	20	PAOZZ	5935-00-131-9680	M39024-11-01	81349	JACK, TIP.....A3J	EA	4
C-6	21	PAOZZ	5905-00-136-1245	RCR32G272JS	81349	RESISTOR, FIXED, COMPOSITION.....A3J	EA	1
C-6	22	PAOZZ	5905-00-111-8372	RCR32G222JS	81349	RESISTOR, FIXED, COMPOSITION.....A3J	EA	1
C-6	23	PAOZZ	5935-00-131-9663	M39024-11-03	81349	JACK, TIP.....A3J	EA	1
C-6	24	PAOZZ	5935-01-033-5275	M39024-11-02	81349	JACK, TIP.....A3J	EA	1
C-6	25	PAOZZ	5905-00-481-0158	RLR20C242GR	81349	RESISTOR, FIXED.....A3J	EA	1
C-6	26	PAOZZ	5905-00-106-1278	RCR07G123JS	81349	RESISTOR, FIXED, COMPOSITION.....A3J	EA	1
C-6	27	PAOZZ	5905-00-106-3666	RCR07G103JS	81349	RESISTOR, FIXED, COMPOSITION.....A3J	EA	1
C-6	28	PAOZZ	5910-00-320-7653	M39022-01-1126	81349	CAPACITOR, FIXED.....A3J	EA	1
C-6	29	PAOZZ	5910-00-133-7553	CK05BX472K	81349	CAPACITOR, FIXED.....A3J	EA	1
C-6	30	XAOZZ		11737744	19200	PRINTED WIRING BOARD ASSEMBLY.....A3J	EA	1
C-6	31	MOOZZ				INSULATION SLEEVING (MFG FROM MIL-I-003190/5).....A3J	EA	1
C-6	32	MOOZZ				WIRE (MFG FROM QQ-W-343).....A3J	EA	1

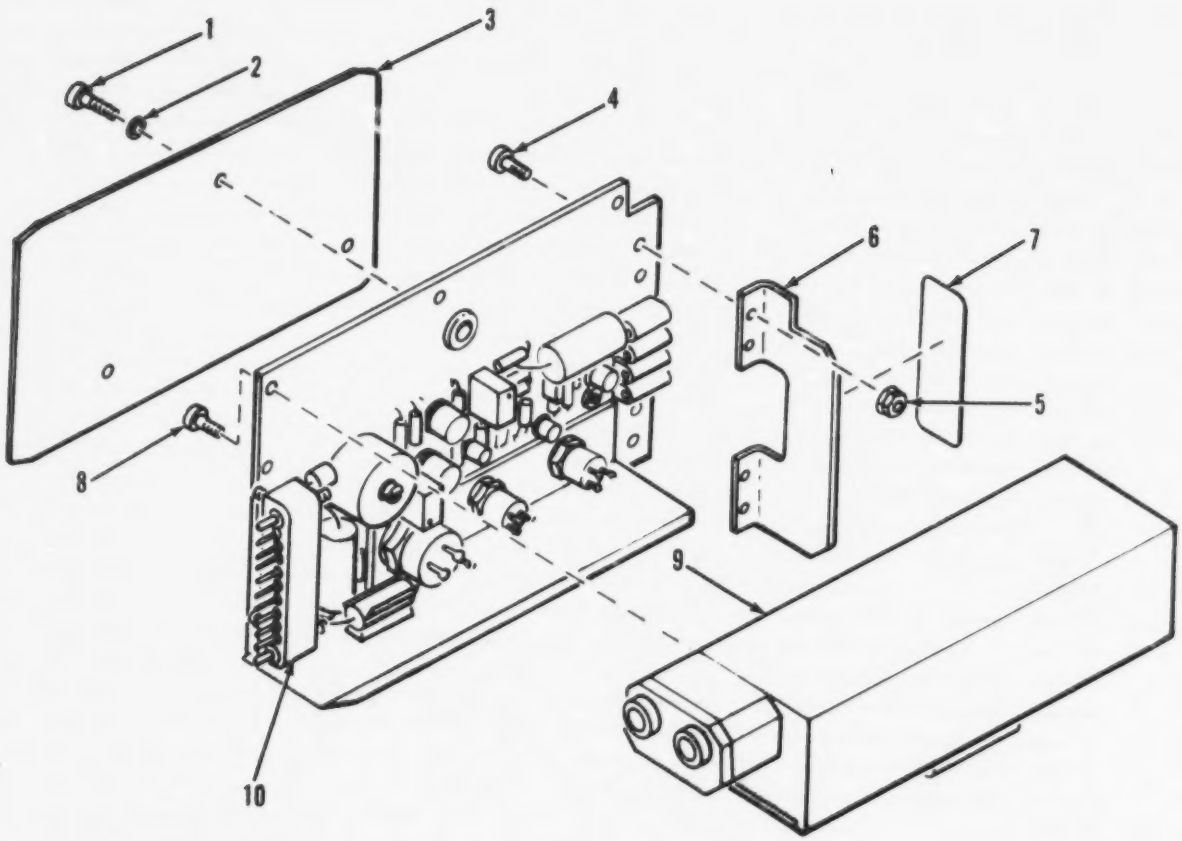


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Figure C-7. Power supply (1 of 3)

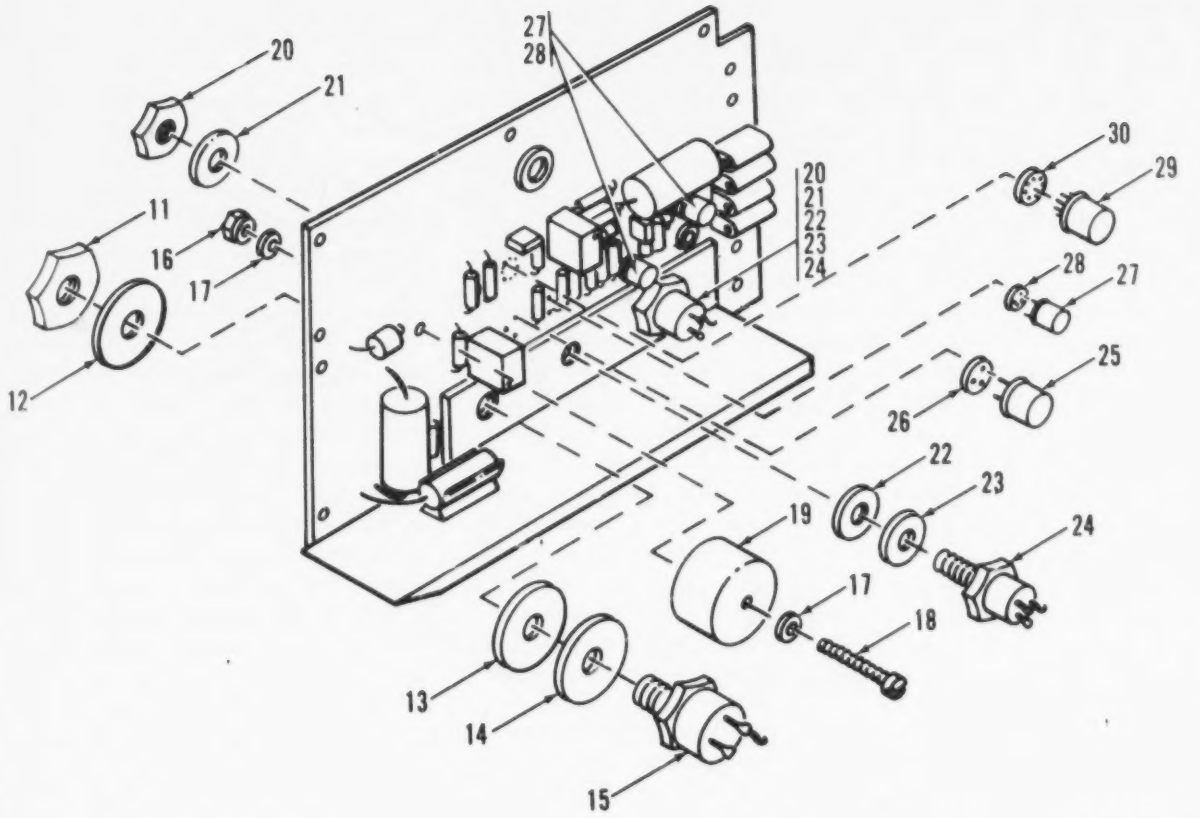

Figure C-7. Power supply (2 of 3)

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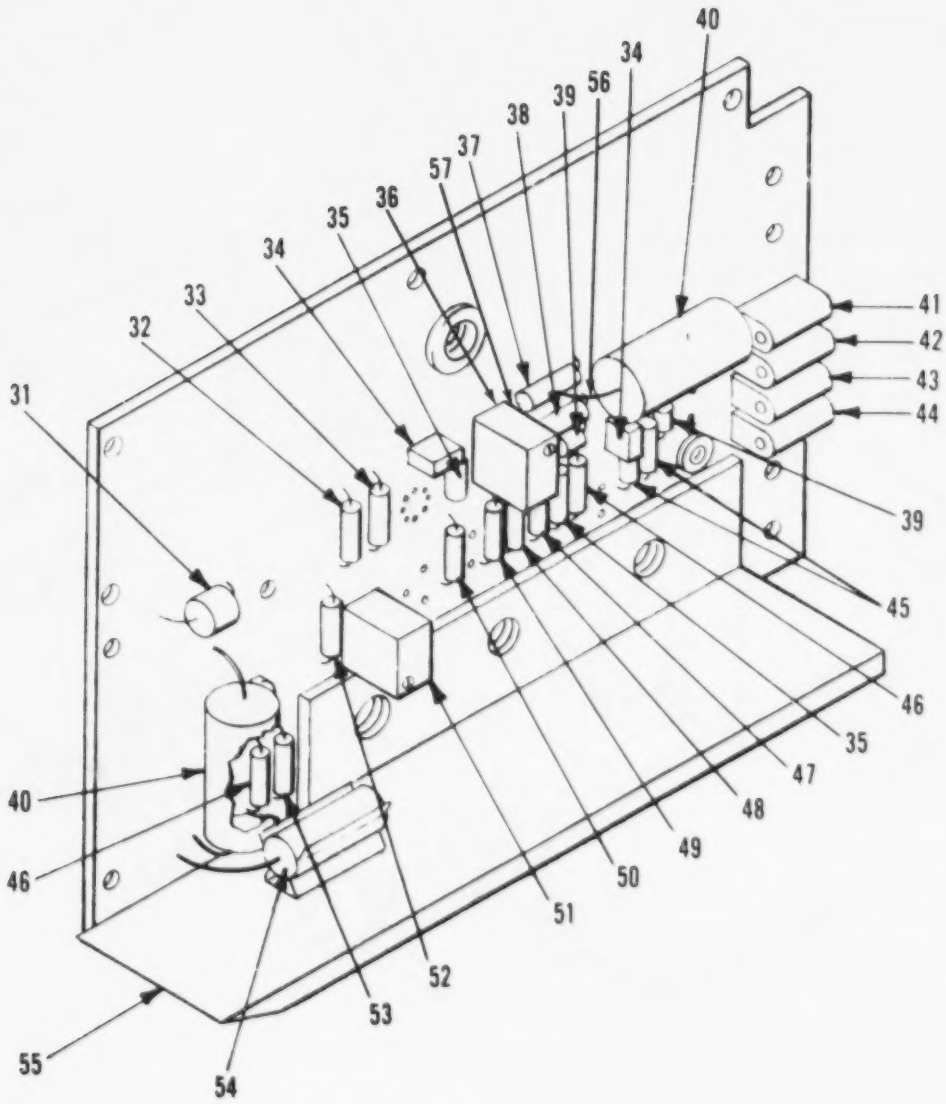

Figure C-7. Power supply (3 of 3)

(1) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 010202 POWER SUPPLY		
						11739861		
C-7	1	PADZZ	5305-00-054-5648	MS51957-14	96906	SCREW, MACHINE.....A30	HD	3
C-7	2	PADZZ	5310-00-550-3715	MS35333-70	96906	WASHER, LOCK.....A30	EA	3
C-7	3	XDDZZ		11739849	19200	GUIDE PLATE.....A30	EA	1
C-7	4	PADZZ	5305-00-959-0379	MS16995-10	96906	SCREW, CAP, SOCKET HEAD.....A30	EA	6
C-7	5	PADZZ	5310-00-874-3292	MS21043-04	96906	NUT, SELF-LOCKING.....A30	EA	6
C-7	6	XDDZZ		11741696	19200	BRACKET.....A30	EA	1
C-7	7	PADZZ	7690-01-040-0406	11741693	19200	MARKER, IDENTIFICATION.....A30	EA	1
C-7	8	XDDZZ		MS24630-12	96906	SCREW, TAPPING.....A30	HD	5
C-7	9	PADZZ	6920-00-248-2681	11739859	19200	HIGH VOLTAGE UNIT ASSEMBLY.....A30	AY	1
C-7	10	PADZZ	6920-00-251-7910	11741659	19200	CONNECTOR.....A30	EA	1
C-7	11	PADZZ	5310-00-685-2631	MS25082-4	96906	NUT, PLAIN, HEXAGON.....A30	EA	1
C-7	12	PADZZ	5310-00-404-1433	MS17180-1	96906	WASHER,FLAT FLAT.....A30	EA	1
C-7	13	PADZZ	5970-00-133-3786	11739834-2	19200	INSULATOR, WASHER.....A30	EA	1
C-7	14	PADZZ	5365-01-045-3728	11747169-2	19200	SPACER, PLATE.....A30	EA	1
C-7	15	PADZZ	5961-00-069-2469	JAN2N1724	81349	TRANSISTOR.....A30	EA	1
C-7	16	PADZZ	5310-00-939-0849	MS21083C04	96906	NUT, SELF-LOCKING.....A30	EA	1
C-7	17	PADZZ	5310-00-595-6211	MS15795-803	96906	WASHER, FLAT.....A30	HD	4
C-7	18	PADZZ	5305-00-054-5653	MS51957-19	96906	SCREW, MACHINE.....A30	EA	1
C-7	19	PADZZ	5950-00-305-4229	11739021	19200	REACTOR.....A30	EA	1
C-7	20	PADZZ	5310-00-655-6930	MS25082-3	96906	NUT, PLAIN, HEXAGON.....A30	EA	2
C-7	21	PADZZ	5310-00-167-0812	AN960C10L	81352	WASHER, FLAT.....A30	EA	2
C-7	22	PADZZ	5970-00-133-4840	11739834-1	19200	INSULATOR, WASHER.....A30	EA	2
C-7	23	PADZZ	5310-01-062-1762	11747169-1	19200	SPACER.....A30	EA	2
C-7	24	PADZZ	5961-00-429-1907	11739838	19200	TRANSISTOR.....A30	EA	2
C-7	25	PADZZ	5961-00-998-9324	JAN2N3635	81349	TRANSISTOR.....A30	EA	1
C-7	26	PADZZ	5999-00-713-0913	11737761	19200	TRANSISTOR SPACER.....A30	EA	1
C-7	27	PADZZ	5961-00-551-8757	JAN2N2222A	81349	TRANSISTOR.....A30	EA	3
C-7	28	PADZZ	5999-00-958-6759	L0540766	19200	MOUNTING PAD, ELECTRIC.....A30	EA	3
C-7	29	PADZZ	5962-00-429-5638	11739823	19200	MICROCIRCUIT, LINEAR.....A30	EA	1
C-7	30	PADZZ	5999-00-132-0012	11739835	19200	MOUNTING PAD, ELECTRIC.....A30	EA	1
C-7	31	PADZZ	5961-00-421-3802	JAN1N5550	81349	SEMICONDUCTOR DEVICE, DIODE.....A30	EA	1
C-7	32	PADZZ	5961-00-842-9609	JAN1N9660	81349	SEMICONDUCTOR DEVICE, DIODE.....A30	EA	4
C-7	33	PADZZ	5905-00-419-2822	RLR07C202GA	81349	RESISTOR, FIXED, FILM.....A30	EA	4
C-7	34	PADZZ	5910-00-111-4011	CK05BX103K	81349	CAPACITOR, FIXED.....A30	EA	2
C-7	35	PADZZ	5961-00-892-3513	1N617	81349	SEMICONDUCTOR DEVICE.....A30	EA	2
C-7	36	PADZZ	5905-00-931-2026	RT24C2W103	81349	RESISTOR, VARIABLE.....A30	EA	1
C-7	37	PADZZ	5905-00-432-0396	RNR55K1692FR	81349	RESISTOR, FIXED, FILM.....A30	EA	4
C-7	38	PADZZ	5905-00-184-1356	RCR07G152JS	81349	RESISTOR, FIXED, COMPOSITION.....A30	EA	1
C-7	39	PADZZ	5961-00-484-9136	JAN1N5615	81349	SEMICONDUCTOR DEVICE, DIODE.....A30	EA	2
C-7	40	PADZZ	5910-01-004-9279	M39006/09-8935	81349	CAPACITOR, FIXED ELECTROLYTIC.....A30	EA	2
C-7	41	PADZZ	5935-00-131-5688	M39024-11-01	81349	JACK, TIP.....A30	EA	1
C-7	42	PADZZ	5935-00-131-9696	M39024-11-04	81349	JACK, TIP.....A30	EA	1
C-7	43	PADZZ	5935-00-131-9696	M39024-11-04	81349	JACK, TIP.....A30	EA	1
C-7	44	PADZZ	5935-00-131-9693	M39024-11-03	81349	JACK, TIP.....A30	EA	1

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
C-7	45	PADZZ	5905-00-110-7620	RCR07G102JS	81349	RESISTOR, FIXED, COMPOSITION.....A30	EA	2
C-7	46	PADZZ	5905-00-214-0711	RCR07G472JS	81349	RESISTOR, FIXED, COMPOSITION.....A30	EA	2
C-7	47	PADZZ	5961-00-995-2310	JAN1N752A	81349	SEMICONDUCTOR DEVICE, DIODE.....A30	EA	4
C-7	48	PADZZ	5961-00-848-7067	JAN1N5688	81349	SEMICONDUCTOR DEVICE, DIODE.....A30	EA	1
C-7	49	PADZZ	5905-00-472-1064	RWR81S6810FR	81349	RESISTOR, FIXED, WIRE.....A30	EA	4
C-7	50	PADZZ	5905-00-141-1183	RCR07G101JS	81349	RESISTOR, FIXED, COMPOSITION.....A30	EA	4
C-7	51	PADZZ	5905-00-103-7437	RT24C2W101	81349	RESISTOR, VARIABLE.....A30	EA	4
C-7	52	PADZZ	5905-00-243-9035	RWR81S267OFR	81349	RESISTOR, FIXED, WIRE.....A30	EA	4
C-7	53	PADZZ	5905-00-489-4545	RCR07G334JS	81349	RESISTOR, FIXED.....A30	EA	4
C-7	54	PADZZ	5905-00-997-9352	RW79U1R0CF	81349	RESISTOR, FIXED, WIRE.....A30	EA	1
C-7	55	XADZZ		11739857	19200	PRINTED WIRING BOARD.....A30	EA	1
C-7	56	NOOZZ				INSULATION SLEEVING (MFG FROM MIL-I-003190/5-22).....A30	EA	1
C-7	57	NOOZZ				WIRE (MFG FROM CO-W-343).....A30	FT	V

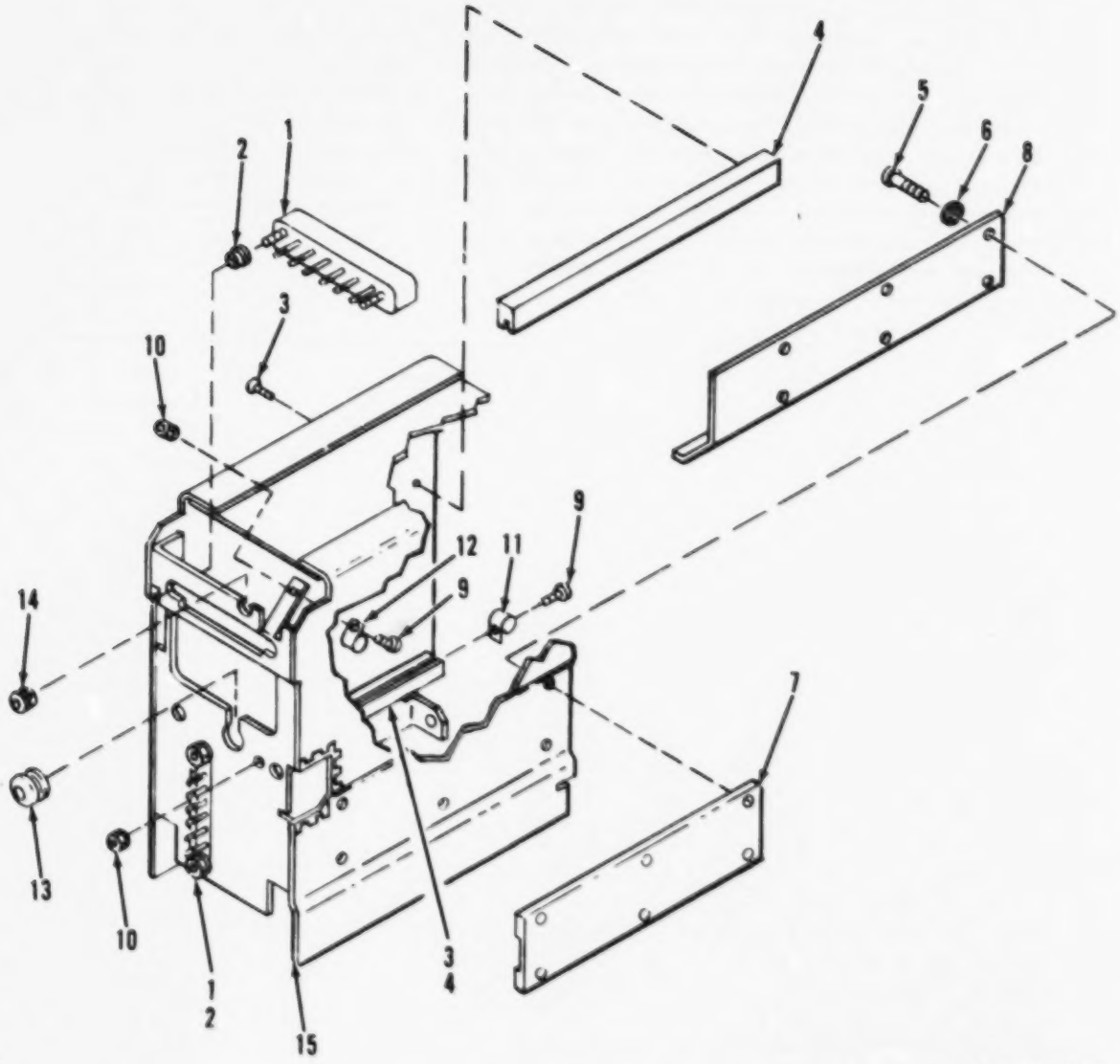

Figure C-8. Chassis assembly

SECTION II

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 010203 CHASSIS ASSEMBLY		
						11737760		
C-8	1	PADZZ		MS5302/17-09	81349	CONNECTOR, PRINTED CIRCUIT.....A30	EA	2
C-8	2	PADZZ	3120-00-361-3943	11737777	19200	BUSHING, SLEEVE.....A30	EA	4
C-8	3	PADZZ	5305-00-766-2422	MS51559-1	96906	SCREW, MACHINE.....A30	EA	6
C-8	4	XDDZZ		11737773	19200	SUPPORT, GUIDE.....A30	EA	2
C-8	5	PADZZ	5305-00-068-5410	MS16995-2	96906	SCREW, CAP, SOCKET HEAD.....A30	EA	6
C-8	6	PADZZ	5310-00-928-2690	MS35338-134	96906	WASHER, LOCK.....A30	EA	6
C-8	7	XDDZZ		11737785	19200	RETAINER, WIRE.....A30	EA	1
C-8	8	XDDZZ		11736833	19200	BRACKET, SUPPORT.....A30	EA	1
C-8	9	PADZZ	5305-00-054-5248	MS51957-14	96906	SCREW, MACHINE.....A30	EA	2
C-8	10	PADZZ	5310-00-939-0849	MS21083C04	96906	NUT, SELF-LOCKING.....A30	EA	2
C-8	11	PADZZ	5340-00-435-8983	11737765-2	19200	CLAMP, LOOP.....A30	EA	1
C-8	12	PADZZ	5340-01-066-3583	11737765-1	19200	CLAMP, LOOP.....A30	EA	1
C-8	13	PADZZ	5325-00-174-5317	MS35489-4	96906	GROMMET, RUBBER.....A30	EA	1
C-8	14	PADZZ	5325-00-286-6047	MS35490-1	96906	GROMMET, RUBBER.....A30	EA	1
C-8	15	XDDZZ		11737772	19200	CHASSIS SUBASSEMBLY.....A30	EA	1

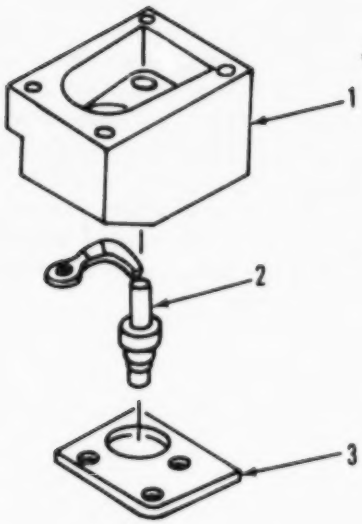

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Figure C-9. Filter housing assembly

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 010204 FILTER HOUSING ASSEMBLY		
						11737725		
C-9	1	XDDZZ		11737773	19200	HOUSING, FILTER.....A3D	EA	1
C-9	2	PADZZ	6920-00-249-2580	11737756	19200	WIRE AND TERMINAL ASSY.....A3D	AY	1
C-9	3	XDDZZ		11737778	19200	GASKET, FILTER HOUSING.....A3D	EA	1

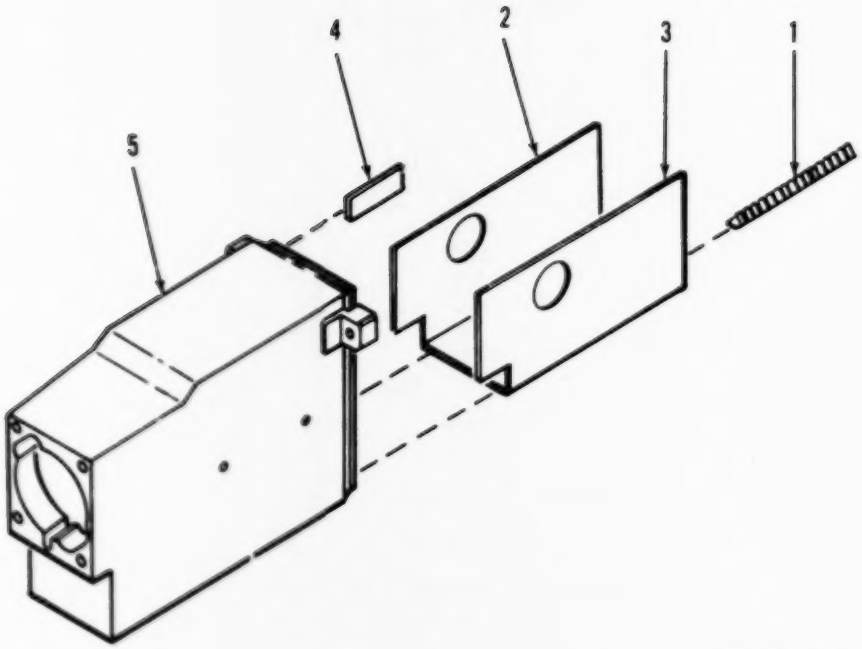

Figure C-10. Enclosure assembly

(1) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 010205 ENCLOSURE ASSEMBLY		
						11737787		
C-10	1	PADZZ	5940-00-283-9967	11739801-2	19200	CONTACT STRIP, RADIO.....A30	EA	4
C-10	2	XDDZZ		11739806	19200	HEAT SINK, BRACKET, RIGHT.....A30	EA	1
C-10	3	XDDZZ		11739807	19200	HEAT SINK, BRACKET, LEFT.....A30	EA	1
C-10	4	PADZZ	9320-00-342-9749	11737784	19200	RUBBER STRIP.....A30	EA	2
C-10	5	XDDZZ		11737767	19200	ENCLOSURE, ELECTRICAL.....A30	EA	1

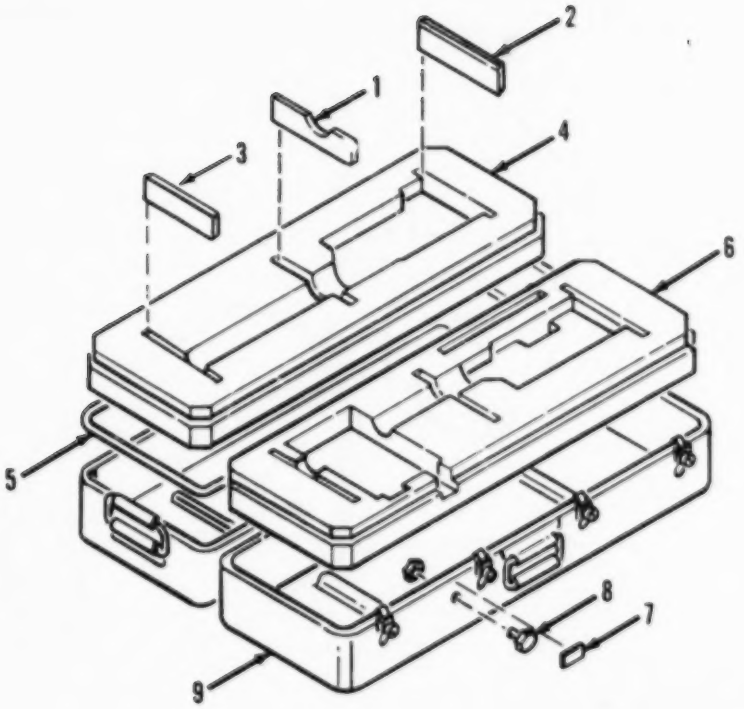

Figure C-11. Carrying case

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 02 CARRYING CASE		
						11743778		
C-11	1	XDDZZ		11743789	19200	CLAMP, BARREL.....A30	EA	2
C-11	2	XDDZZ		11743789-1	19200	STOP, ENCLOSURE.....A30	EA	1
C-11	3	XDDZZ		11743789-2	19200	STOP, ENCLOSURE.....A30	EA	3
C-11	4	XDDZZ		11743783	19200	CUSHION, LID.....A30	EA	1
C-11	5	XDDZZ		8644392-1	19200	PACKING, PREFORMED.....A30	EA	1
C-11	6	XDDZZ		11743782	19200	CUSHION, BODY.....A30	EA	4
C-11	7	XDDZZ		11746786	19200	PLATE, INSTRUCTION.....A30	EA	1
C-11	8	XDDZZ	4820-00-906-1339	MS18016-1	96906	COCK, DRAIN.....A30	EA	1
C-11	9	XDDZZ		11743779	19200	CASE ASSEMBLY.....A30	EA	1

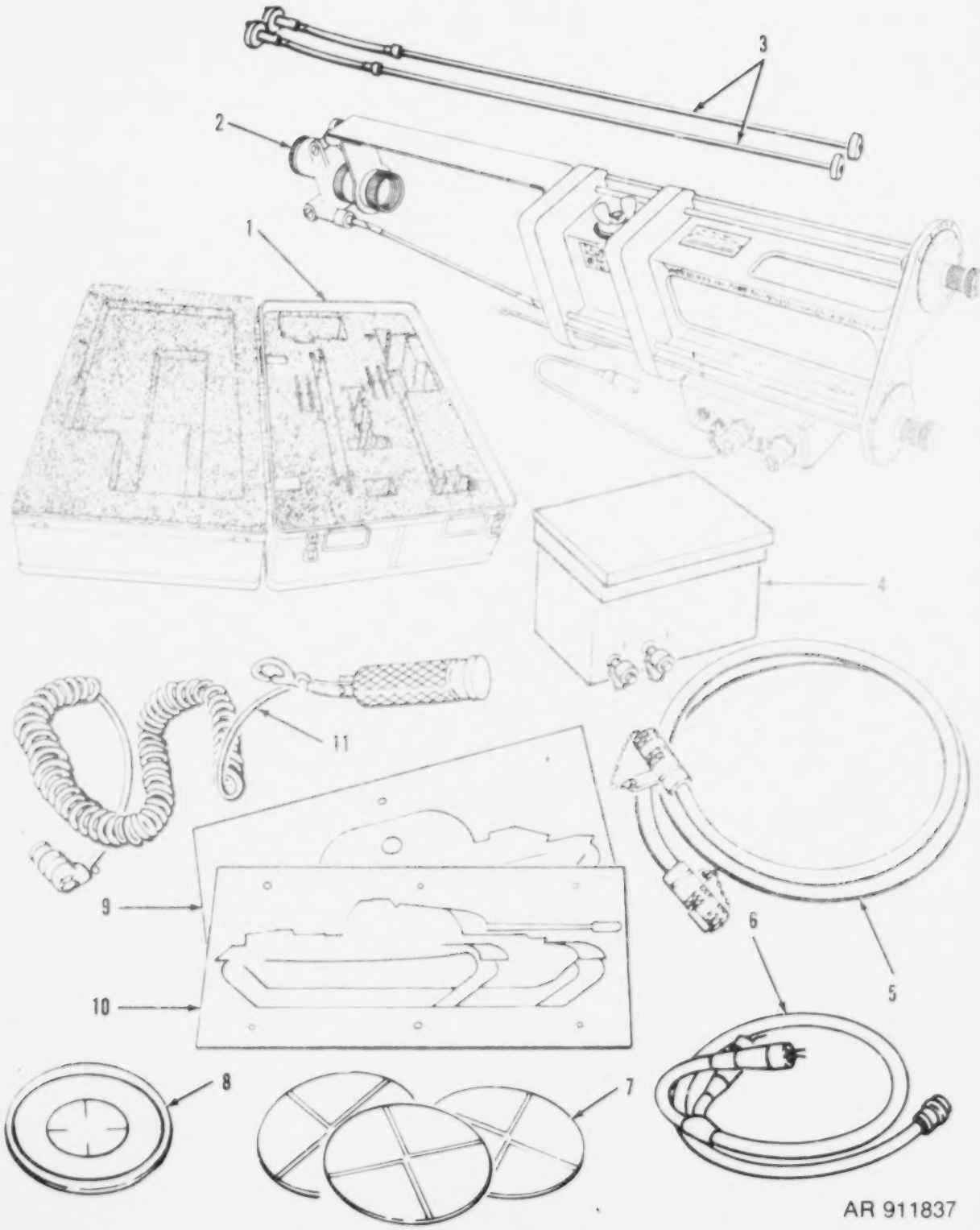

Figure C-12. Field artillery direct fire trainer (1 of 2)

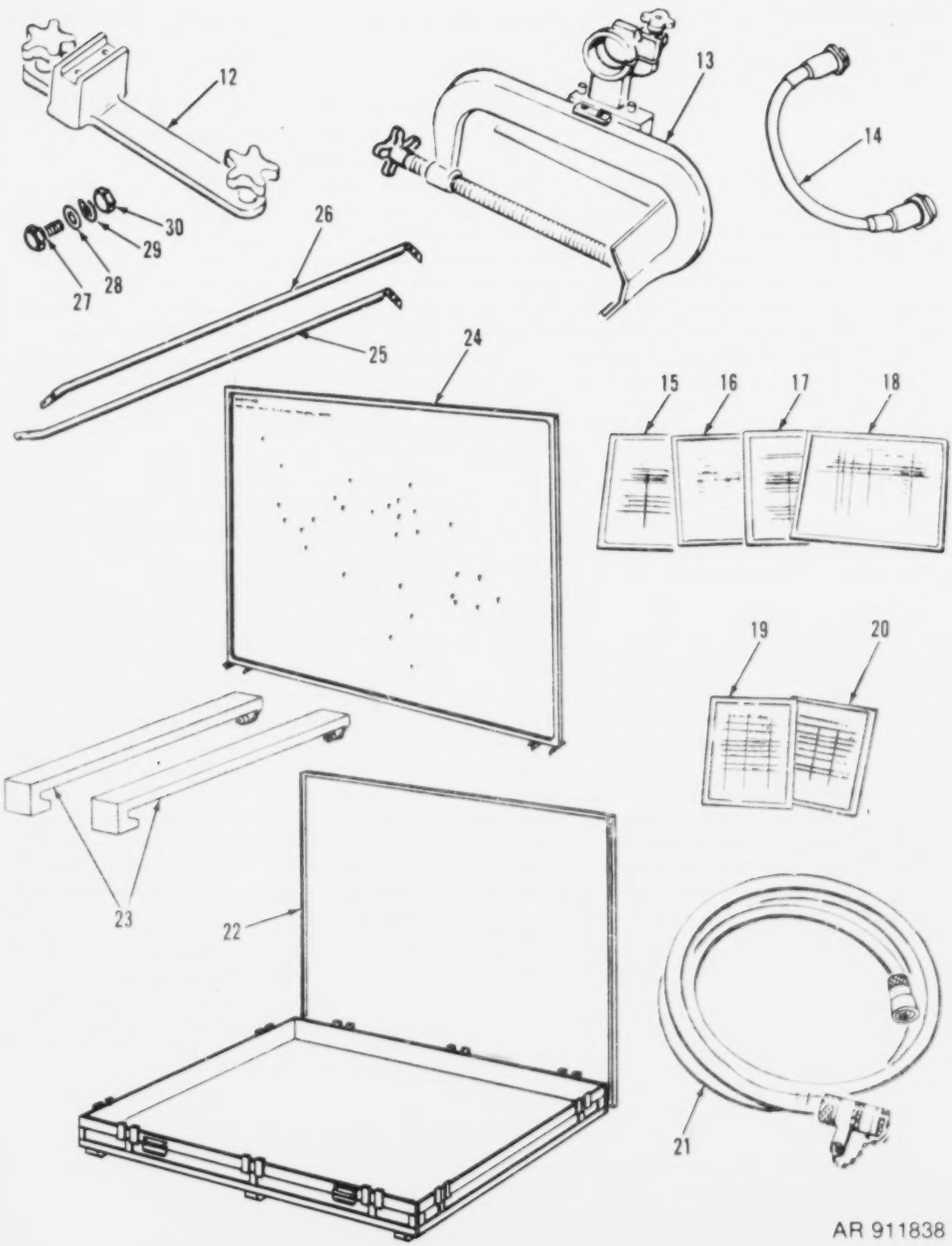

Figure C-12. Field artillery direct fire trainer (2 of 2)

SECTION II

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1000 FIELD ARTILLERY DIRECT FIRE		
						TRAINER (ADFT) 11746409		
C-12	1	PCFFD	6920-01-051-2014	11747138	19200	CASE, OPTICAL INSTRUMENT.....F59	EA	1
C-12	2	PDFDD	1240-01-054-5550	11746410	19200	OPTICAL ASSEMBLY, DEFLECTOR.....F59	EA	4
C-12	3	PDFDD	5340-01-027-4218	11746446	19200	CONTROL ROD.....F59	EA	2
C-12	4	PDFDL	6110-01-032-5121	11746453	19200	DISTRIBUTION BOX.....F59	EA	1
C-12	5	PAFFF	6920-01-025-4597	11746452	19200	CABLE ASSEMBLY, 20 FT.....F59	EA	3
C-12	6	PAFFF	6920-01-033-3683	11746454	19200	CABLE ASSEMBLY, 10 FT.....F59	EA	1
C-12	7	PAFZZ	6920-01-028-4572	11746461	19200	TARGET ASSEMBLY, BORESIGHT.....F59	EA	3
C-12	8	PAFZZ	6920-01-024-9850	11746464	19200	TARGET ASSEMBLY, LASER.....F59	EA	1
C-12	9	PAFZZ	6920-01-030-5224	11746468	19200	TARGET ASSEMBLY, STATIONARY.....F59	EA	4
C-12	10	PAFZZ	6920-01-030-3418	11746475	19200	TARGET ASSEMBLY, MOVING.....F59	EA	1
C-12	11	PAFFF	1095-01-057-6586	11746480	19200	LANYARD, FIRING.....F59	EA	1
C-12	12	PDFDD	6920-01-028-4568	11747146	19200	ADAPTER ASSEMBLY.....F59	EA	4
C-12	13	PDFDL	6920-01-025-4599	11747147	19200	MOUNT ASSEMBLY.....F59	EA	1
C-12	14	PAFFZ	6920-01-054-0394	11747152	19200	CABLE ASSEMBLY.....F59	EA	4
C-12	15	PAFZZ	6920-01-025-4601	11747153	19200	DEFECTION TABLE, M101A1 HOWITZER.....F59	EA	1
C-12	16	PAFZZ	6920-01-025-4600	11747154	19200	DEFLECTION TABLE, M102 HOWITZER.....F59	EA	1
C-12	17	PAFZZ	6920-01-028-4571	11747155	19200	DEFLECTION TABLE, M114A1/M114A2 HOWITZER.....F59	EA	1
C-12	18	PAFZZ	6920-01-028-4570	11747156	19200	DEFLECTION TABLE, M109A1 HOWITZER.....F59	EA	1
C-12	19	PAFZZ	6920-01-026-9383	11747164	19200	DEFLECTION TABLE, M109 HOWITZER.....F59	EA	1
C-12	20	PAFZZ	6920-01-028-2433	11748078	19200	DEFLECTION TABLE, M198 HOWITZER.....F59	EA	1
C-12	21	PAFFD	6920-01-024-9205	11747170	19200	CABLE ASSEMBLY, M139 POWER.....F59	EA	1
C-12	22	PDDZZ	8140-01-037-6338	11747167	19200	SHIPPING AND STORAGE CONTAINER.....F59	EA	1
C-12	23	PDFDL	6920-01-027-8353	11746509	19200	BASE ASSEMBLY.....F59	EA	2
C-12	24	PDFFD	6920-01-039-8539	11746502	19200	SUPPORT ASSEMBLY, TARGET.....F59	EA	1
C-12	25	PAFZZ	6920-01-026-2672	10554643-1	19200	SUPPORT, LEFT, TARGET.....F59	EA	2
C-12	26	PAFZZ	6920-01-026-2673	10554643-2	19200	SUPPORT, RIGHT, TARGET.....F59	EA	2
C-12	27	PAFZZ	5305-00-267-8253	MS35307-108	96906	SCREW, CAP, HEXAGON.....F59	EA	12
C-12	28	PAFZZ	5310-00-582-5677	MS15795-810	96906	WASHER, FLAT.....F59	EA	24
C-12	29	PAFZZ	5310-00-543-2740	MS35333-74	96906	WASHER, LOCK.....F59	EA	12
C-12	30	PAFZZ	5310-00-259-9477	MS35649-2254	96906	NUT, PLAIN, HEXAGON.....F59	EA	12

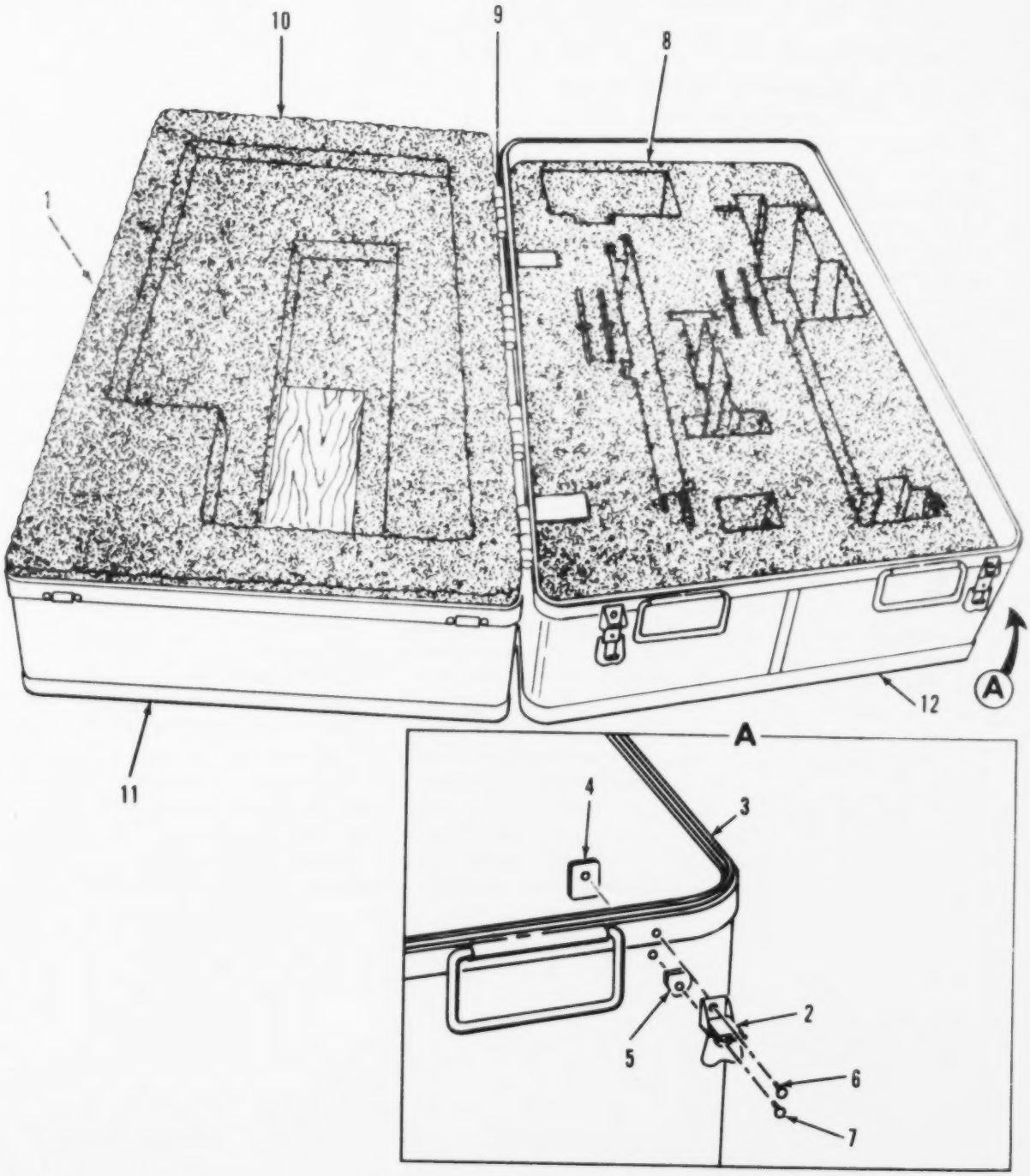

Figure C-13. Carrying case

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U M	(8) QTY INC IN UNIT
						GROUP 1001 CARRYING CASE		
						11747158		
C-13	1	XDFZZ		11746786	19200	PLATE.....F59	EA	1
C-13	2	XDFZZ	1220-00-460-2585	8643741	19200	FASTENER.....F59	EA	8
C-13	3	XDFZZ	5330-00-993-4916	8644392-1	19200	PACKING, PREFORMED.....F59	EA	1
C-13	4	XDFZZ		10548425	19200	PLATE.....F59	EA	8
C-13	5	XDFZZ		10548737	19200	SPACER.....F59	EA	8
C-13	6	XDFZZ		MS20470DD4-10-5	96906	RIVET.....F59	EA	40
C-13	7	XDFZZ		MS20470DD4-12	96906	RIVET.....F59	EA	8
C-13	8	XDFZZ		11747162	19200	CUSHION.....F59	EA	1
C-13	9	XDFZZ		11746399	19200	HINGE.....F59	EA	4
C-13	10	XDFZZ		11747161	19200	CUSHION.....F59	EA	1
C-13	11	XDFZZ		11747160	19200	COVER.....F59	EA	1
C-13	12	XDFZZ		11747159	19200	BODY.....F59	EA	1

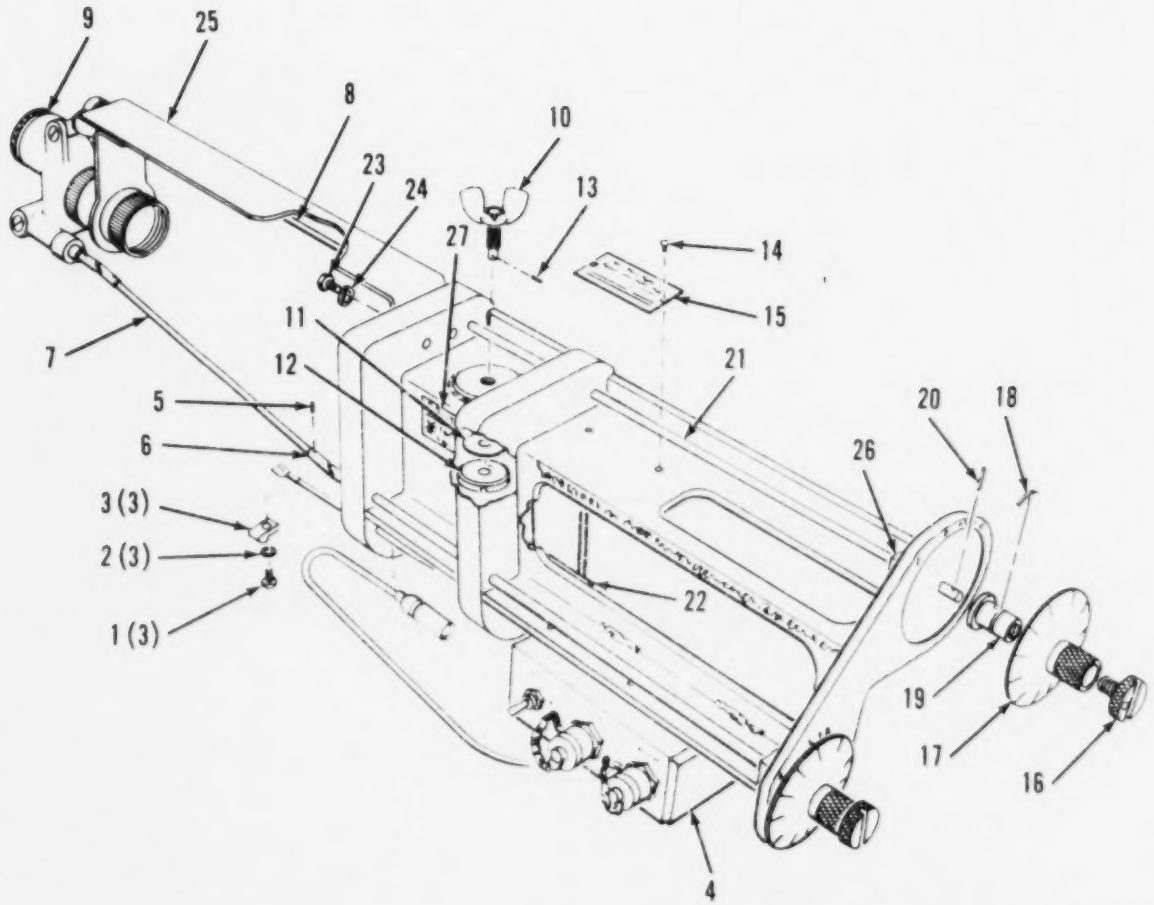

Figure C-14. Deflector optical assembly

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1002 DEFLECTOR OPTICAL ASSEMBLY 11746410		
C-14	1	PAFZZ	5305-00-050-9229	MS51957-63	96906	SCREW, MACHINE.....F59	EA	3
C-14	2	PAFZZ	5310-00-933-8120	MS35338-138	96906	WASHER, LOCK.....F59	EA	3
C-14	3	PAFZZ	5340-00-753-3456	MS25281R2	96906	CLAMP, LOOP.....F59	EA	3
C-14	4	XDFFD		11746456	19200	CONTROL BOX ASSEMBLY.....F59	EA	1
C-14	5	PAFZZ	5315-00-806-7039	MS16555-604	96906	PIN, STRAIGHT, HEADLESS.....F59	EA	8
C-14	6	PAFZZ	3010-00-269-9585	MS20270B6	96906	UNIVERSAL JOINT.....F59	EA	4
C-14	7	PAFZZ	5340-01-035-9243	11746415-3	19200	SHAFT, STRAIGHT.....F59	EA	1
C-14	8	PAFZZ	5340-01-025-5558	11746415-2	19200	ROD, STRAIGHT, HEADLESS.....F59	EA	1
C-14	9	PADDL	6920-01-057-1622	11746421	19200	DEFLECTOR ASSEMBLY.....F59	EA	1
C-14	10	PAFZZ	5305-01-024-5472	11746417	19200	THUMBSCREW.....F59	EA	1
C-14	11	PAFZZ	5310-01-033-1154	11746419	19200	WASHER, FLAT.....F59	EA	1
C-14	12	PAFZZ	6920-01-024-5176	11746420	19200	PAD, CUSHIONING.....F59	EA	1
C-14	13	PAFZZ	5315-00-882-1438	MS16562-193	96906	PIN, SPRING.....F59	EA	1
C-14	14	PAFZZ	5305-00-054-5637	MS51957-3	96906	SCREW, MACHINE.....F59	EA	2
C-14	15	XDFZZ		11746493	19200	PLATE, IDENTIFICATION.....F59	EA	1
C-14	16	XDFZZ		11746414	19200	KNOB.....F59	EA	2
C-14	17	XDFZZ		11746413	19200	SCALE.....F59	EA	2
C-14	18	PAFZZ	5240-00-777-1372	8634478	19200	CLIP CARBON STL 3/4I.....F59	EA	2
C-14	19	XDFZZ		11746412	19200	ADAPTER.....F59	EA	2
C-14	20	PAFZZ	5315-00-806-7040	MS16555-620	96906	PIN, STRAIGHT, HEADLESS.....F59	EA	2
C-14	21	PAFZZ	5340-01-035-9244	11746415-1	19200	SHAFT, STRAIGHT.....F59	EA	1
C-14	22	PADZZ	6920-01-024-5777	11746416	19200	PAD, CUSHIONING.....F59	EA	2
C-14	23	PAFZZ	5305-00-725-3626	MS35307-304	96906	SCREW, CAP, HEXAGON.....F59	EA	2
C-14	24	PAFZZ	5310-00-933-8121	MS35338-139	96906	WASHER, LOCK.....F59	EA	2
C-14	25	XDFZZ		11728957	19200	HOLDER, DEFLECTOR.....F59	EA	1
C-14	26	XDDZZ		11746411	19200	BRACKET.....F59	EA	1
C-14	27	PAFZZ	7690-01-027-3395	11741698	19200	MARKER, IDENTIFICATION.....F59	EA	1

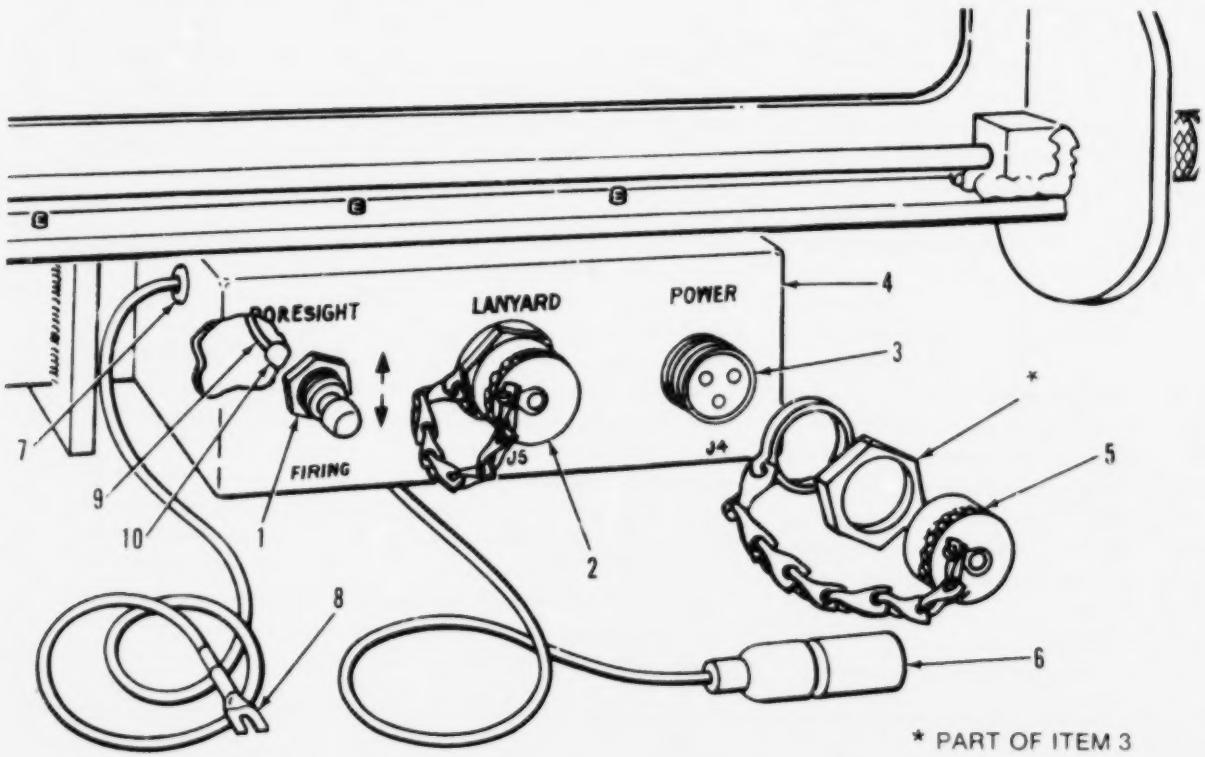

Figure C-15. Control box assembly

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 100201 CONTROL BOX ASSEMBLY		
						1174656		
C-15	1	PAFZZ	5930-01-064-9659	MS24612K312	96906	SWITCH.....F59	EA	1
C-15	2	PAFZZ	5935-00-086-2369	MS3114E12-35	96906	CONNECTOR, RECEPTACLE.....F59	EA	1
C-15	3	PAFZZ	5935-00-845-2537	MS3114E12-3P	96906	CONNECTOR, RECEPTACLE.....F59	EA	1
C-15	4	XDFZZ		11746457	19200	BOX.....F59	EA	1
C-15	5	PAFZZ	5935-00-913-1823	M83181-12N	96906	COVER, ELECTRICAL CONNECTOR.....F59	EA	2
C-15	6	PAFZZ	5935-00-115-2367	MS27144-2	96906	CONNECTOR, PLUG, ELECTRICAL.....F59	EA	A
C-15	7	PAFZZ	5325-00-185-0817	MS35489-33	96906	GROMMET, RUBBER.....F59	EA	A
C-15	8	PAFZZ	5940-00-800-1102	MS35440-1	96906	TERMINAL, LUG.....F59	EA	1
C-15	9	MFFZZ				CABLE, TYPE 1, CLASS A, COLOR BLACK (MFG FROM MIL-C-13486/1) F59	EA	V
C-15	10	MFFZZ				INSULATION SLEEVING C1-.3758 (MANUFACTURED FROM MIL-I-23053/5).....F59	EA	V

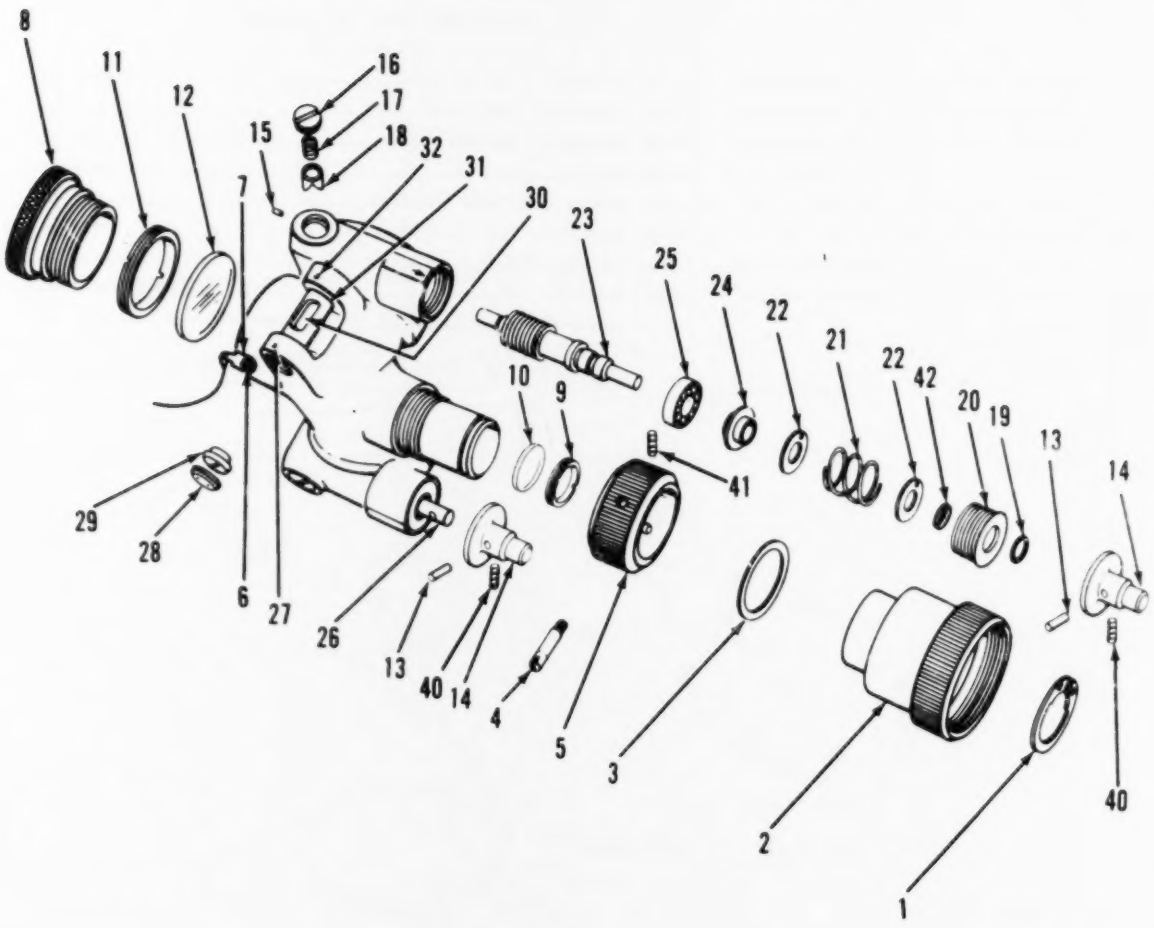

Figure C-16. Deflector assembly (1 of 2)

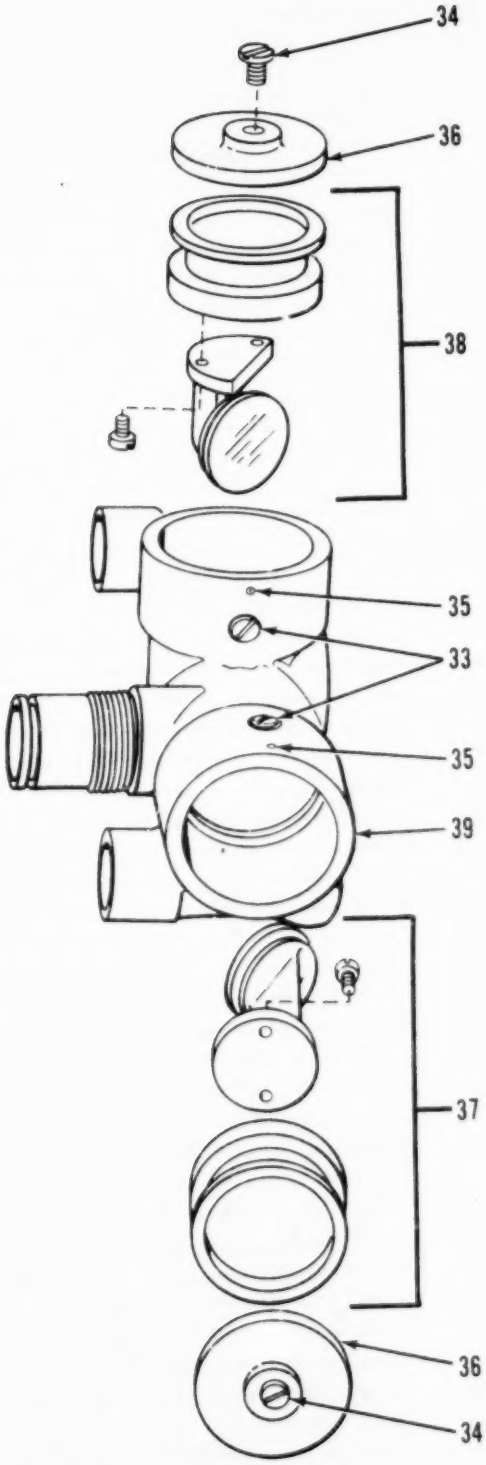

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Figure C-16. Deflector assembly (2 of 2)

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 100201 DEFLECTOR ASSEMBLY		
						11746421		
C-16	1	PAFZZ		MS16626-4118	96906	RING.....F59	EA	1
C-16	2	XDFZZ		11746423	19200	ADAPTER.....F59	EA	1
C-16	3	PAFZZ	5970-01-037-8912	11746470-2	19200	INSULATOR, WASHER.....F59	EA	1
C-16	4	PAFZZ	5315-01-026-4735	11746425	19200	PIN, SHOULDER, HEADLESS.....F59	EA	1
C-16	5	XDFZZ		11746424	19200	RING.....F59	EA	1
C-16	6	PAFZZ	5305-00-054-5646	MS51957-12	96906	SCREW, MACHINE.....F59	EA	4
C-16	7	PAFZZ	5310-00-595-6211	MS15795-803	96906	WASHER, FLAT.....F59	EA	1
C-16	8	PAFZZ	6920-01-027-8356	11748075	19200	PLUG ASSEMBLY.....F59	EA	1
C-16	9	PADZZ	6920-01-026-6660	11746442	19200	RETAINER, OPTICAL INSTRUMENT.....F59	EA	1
C-16	10	PADZZ	6920-01-033-2325	11746441	19200	WINDOW, OPTICAL INSTRUMENT.....F59	EA	1
C-16	11	PADZZ	6920-01-031-7276	11746444	19200	RETAINER, OPTICAL INSTRUMENT.....F59	EA	1
C-16	12	PADZZ	6920-01-031-6104	11746443	19200	WINDOW, OPTICAL INSTRUMENT.....F59	EA	1
C-16	13	PADZZ	5315-00-187-3241	MS24692-54	96906	PIN, TAPER.....F59	EA	2
C-16	14	PADZZ	6920-01-024-9051	11746426	19200	ADAPTER.....F59	EA	2
C-16	15	PADZZ	5305-00-728-5486	MS51973-1	96906	SETSCREW.....F59	EA	2
C-16	16	PADZZ	6920-01-038-5913	11746427	19200	PLUG, ADJUSTING, BALL.....F59	EA	2
C-16	17	XCDZZ		MS24585-C109	96906	SPRING.....F59	EA	2
C-16	18	XDDZZ		10956449	19200	BEARING, V.....F59	EA	2
C-16	19	PADZZ	6920-01-028-5289	10516541	19200	PACKING, QUAD RING.....F59	EA	2
C-16	20	XDDZZ		11746429	19200	RETAINER.....F59	EA	2
C-16	21	XDDZZ		MS24585-C423	96906	SPRING.....F59	EA	2
C-16	22	XDDZZ		11746470-1	19200	WASHER.....F59	EA	4
C-16	23	XDDZZ		11746428-1	19200	WORMSHAFT.....F59	EA	1
C-16	24	XDDZZ		11746471	19200	NUT, SPECIAL.....F59	EA	2
C-16	25	XDDZZ		8293172	19200	BEARING, BALL, SELF-ALIGNING.....F59	EA	2
C-16	26	XDDZZ		11746428-2	19200	WORMSHAFT.....F59	EA	1
C-16	27	PADZZ	5305-00-717-6555	MS51963-1	96906	SETSCREW.....F59	EA	1
C-16	28	PADZZ	5365-00-878-9587	8624238	19200	RING, EXTERNALLY THREADED.....F59	EA	1
C-16	29	PADZZ	1240-00-936-8362	8624241	19200	BALL, ECCENTRIC CRES.....F59	EA	4
C-16	30	PADZZ	1290-00-726-3813	8626161	19200	LEVEL, FIRE CONTROL.....F59	EA	1
C-16	31	PADDZ	1240-00-536-5400	8624237	19200	COVER, LEVEL, VIAL.....F59	EA	1
C-16	32	PADZZ	5315-00-817-6889	MS16555-601	96906	PIN, STRAIGHT, HEADLESS.....F59	EA	1
C-16	33	PAEZZ	5305-01-024-5463	11746431	19200	SCREW, EXTERNALLY THREADED.....F59	EA	2
C-16	34	PADZZ	5305-00-085-4056	MS3212-39	96906	SCREW, MACHINE.....F59	EA	2
C-16	35	PADZZ	5305-00-051-4484	MS51973-9	96906	SETSCREW.....F59	EA	4
C-16	36	XDDZZ		11746433	19200	RETAINER.....F59	EA	2
C-16	37	PADZZ	6920-01-028-4569	11746437	19200	MIRROR ASSEMBLY, Azimuth F59	EA	1
C-16	38	PADZZ	6920-01-024-9048	11746432	19200	MIRROR ASSEMBLY, ELEVATION.....F59	EA	1
C-16	39	XADZZ		11746422	19200	HOUSING.....F59	EA	1
C-16	40	XDDZZ	5305-00-724-6740	MS51965-17	96906	SETSCREW.....F59	EA	2
C-16	41	XDDZZ	5305-00-057-0516	MS51958-19	96906	SETSCREW.....F59	EA	5
C-16	42	PADZZ	5305-00-057-0516	MS51958-19	96906	PACKING, PREFORMED.....F59	EA	1

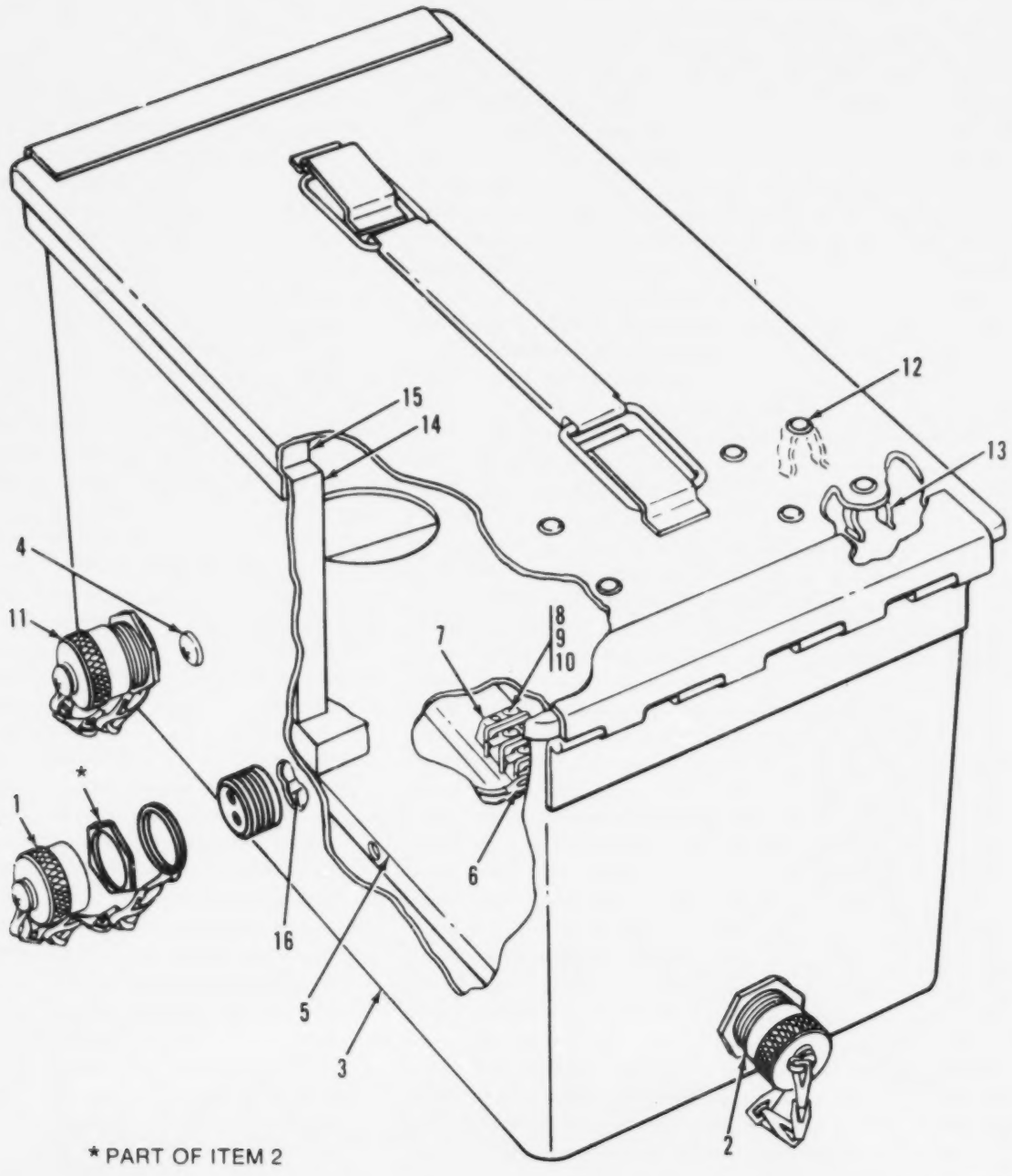


Figure C-17. Distribution box

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1003 DISTRIBUTION BOX		
						11746450		
C-17	1	PAFZZ	5935-00-913-1823	MS3181-12N	96906	COVER, ELECTRICAL.....F59	EA	5
C-17	2	PADZZ	5935-00-845-2537	MS3114E12-3P	96906	CONNECTOR, RECEPTACLE.....F59	EA	1
C-17	3	XBDZZ		11746451	19200	BOX.....F59	EA	1
C-17	4	PADZZ	5305-00-051-8499	MS24626-1	96906	SCREW, TAPPING, THREAD.....F59	EA	4
C-17	5	XDDZZ		11746478	19200	PLATE.....F59	EA	1
C-17	6	PADZZ		MS5164/7-T8LD	96906	TERMINAL BOARD LUG.....F59	EA	4
C-17	7	PADZZ	5940-00-983-6046	MILT55164	81349	TERMINALS.....F59	EA	1
C-17	8	PADZZ	5305-00-940-9491	MS35275-230	96906	SCREW, MACHINE.....F59	EA	2
C-17	9	PADZZ	5310-00-929-6355	MS35338-136	96906	WASHER, LOCK.....F59	EA	2
C-17	10	PADZZ	5310-00-146-7182	MS25082-C1	96906	NUT, PLAIN, HEXAGON.....F59	EA	2
C-17	11	PADZZ	5935-00-886-2369	MS3114E12-3S	96906	CONNECTOR.....F59	EA	4
C-17	12	PADZZ	5320-00-721-5244	MS16535-77	96906	RIVET, TUBULAR.....F59	EA	8
C-17	13	PADZZ		M24066-3-109	81349	SLIP, SPRING TENSION.....F59	EA	8
C-17	14	XDDZZ		16556450	19200	INSERT.....F59	EA	1
C-17	15	XDDZZ		16556451	19200	PAD, TOP.....F59	EA	1
C-17	16	WDDZZ				CABLE, TYPE 1, CLASS A, COLOR BLACK (MFG FROM MIL-C-13486/1) F59	EA	V

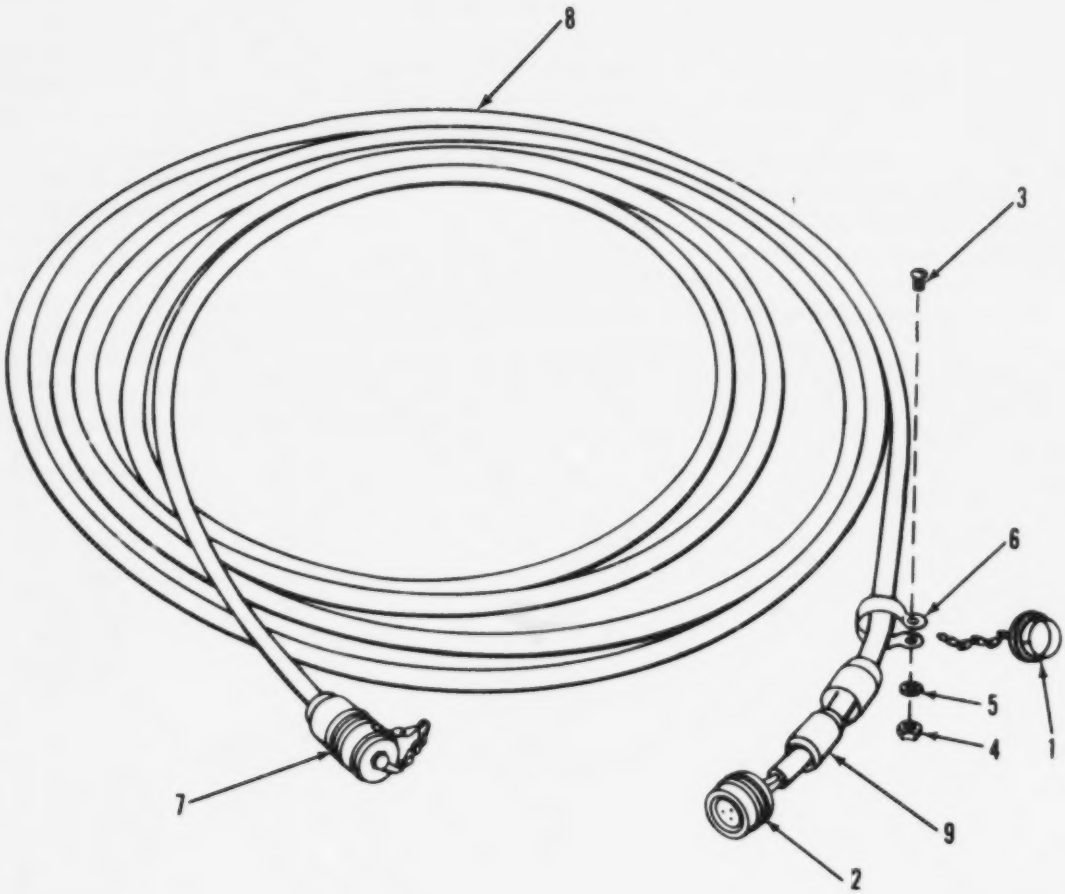


Figure C-18. Cable assembly (20 ft)

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1004 CABLE ASSEMBLY 11746452		
C-18	1	PAPZZ	5935-00-946-3091	MS3180-12C	96906	COVER, ELECTRICAL.....F59	EA	2
C-18	2	PAPZZ	5935-01-024-5498	11746453-2	19200	CONNECTOR, PLUG, ELECTRICAL.....F59	EA	1
C-18	3	PAPZZ	5305-00-054-6652	MS51937-28	96906	SCREW, MACHINE.....F59	EA	2
C-18	4	PAPZZ	5310-00-934-9761	MS35649-264	96906	NUT, PLAIN, HEXAGON.....F59	EA	2
C-18	5	PAPZZ	5310-00-616-3955	MS35333-71	96906	WASHER, LOCK.....F59	EA	2
C-18	6	PAPZZ	5340-00-685-0357	MS122911	96906	CLAMP, LOOP.....F59	EA	2
C-18	7	PAPZZ	5935-01-025-6477	11746453-1	19200	CONNECTOR, PLUG, ELECTRICAL.....F59	EA	1
C-18	8	XAPZZ				CABLE, POWER (MFD FROM MIL-C-3432).....F59	EA	V
C-18	9	MPPZZ				INSULATION SLEEVING C1-.900B (MANUFACTURED FROM MIL-I-23053/5).....F59	EA	V

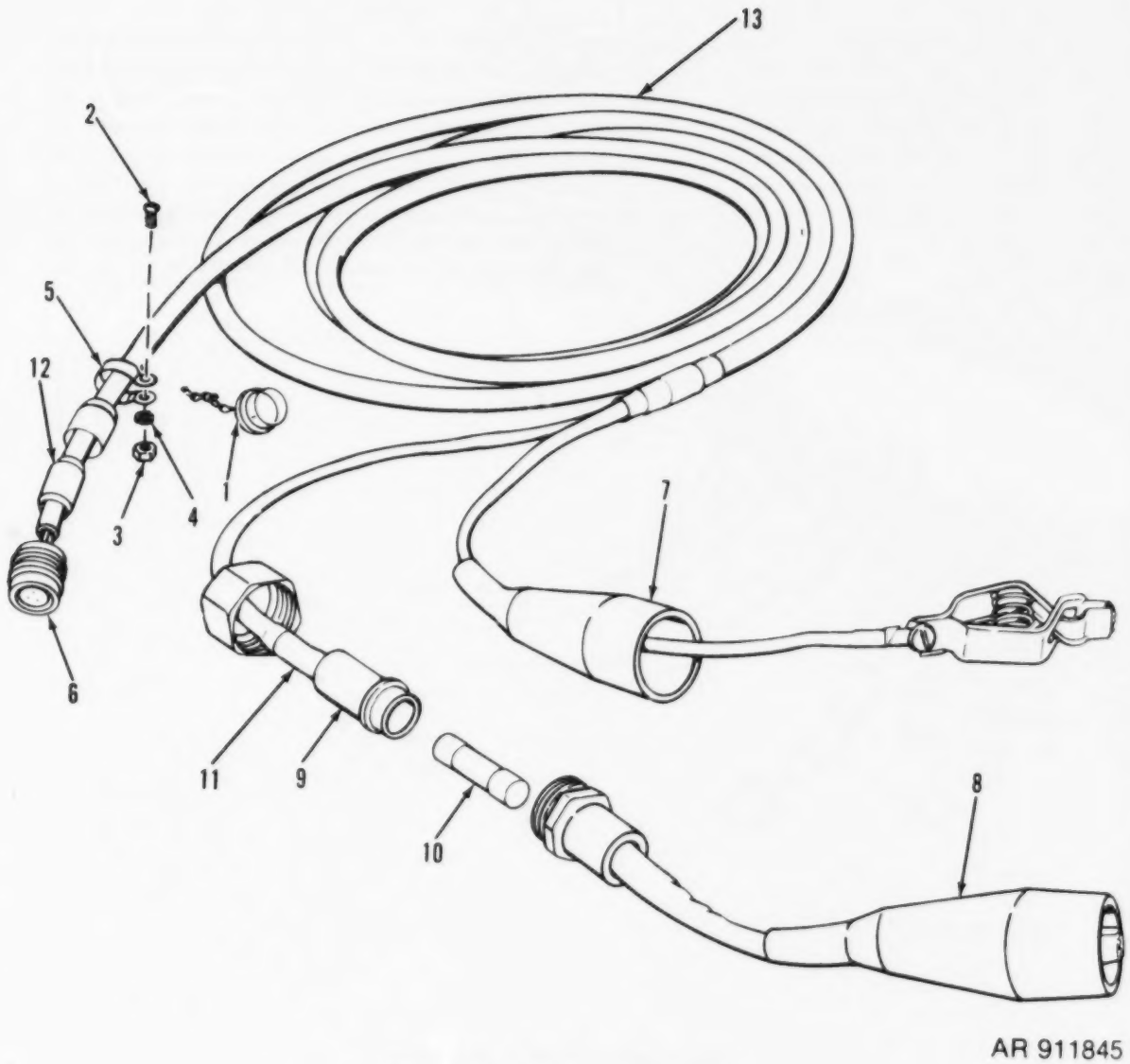


Figure C-19. Cable assembly (10 ft)

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1305 CABLE ASSEMBLY 11746454		
C-19	1	PAFZZ	5935-00-946-2091	MS3180-12C	96906	COVER, ELECTRICAL.....F59	EA	1
C-19	2	PAFZZ	5305-00-054-6852	MS51957-28	96906	SCREW, MACHINE.....F59	EA	1
C-19	3	PAFZZ	5310-00-534-5761	MS35649-264	96906	NUT, PLAIN, HEXAGON.....F59	EA	1
C-19	4	PAFZZ	5310-00-616-3555	MS35333-71	96906	WASHER, LOCK.....F59	EA	1
C-19	5	PAFZZ	5340-00-685-0557	MS122911	96906	CLAMP, LOOP.....F59	EA	1
C-19	6	PAFZZ	5935-01-025-6477	11746453-1	19200	CONNECTOR, PLUG, ELECTRICAL.....F59	EA	1
C-19	7	PAFZZ	5999-00-234-8350	MC440TYPEPC4	81348	CLIP, ELECTRICAL.....F59	PG	1
C-19	8	PAFZZ	5999-00-284-8359	MC440TYPEPC4	81348	CLIP, ELECTRICAL.....F59	PG	1
C-19	9	XAFZZ		11746475	19200	FUSEHOLDER.....F59	EA	1
C-19	10	PAOZZ	5920-00-280-4431	F39A250V10AS	81349	FUSE, CARTRIDGE.....F59	EA	1
C-19	11	XAFZZ				INSULATION SLEEVING C1-.250B (MANUFACTURED FROM MIL-I-23053/5).....F59	EA	V
C-19	12	XAFZZ				INSULATION SLEEVING C1-.500B (MANUFACTURED FROM MIL-I-23053/5).....F59	EA	V
C-19	13	XAFZZ				CABLE, POWER, ELECTRIC (MANUFACTURED FROM MIL-C-3432).....F59	FT	V

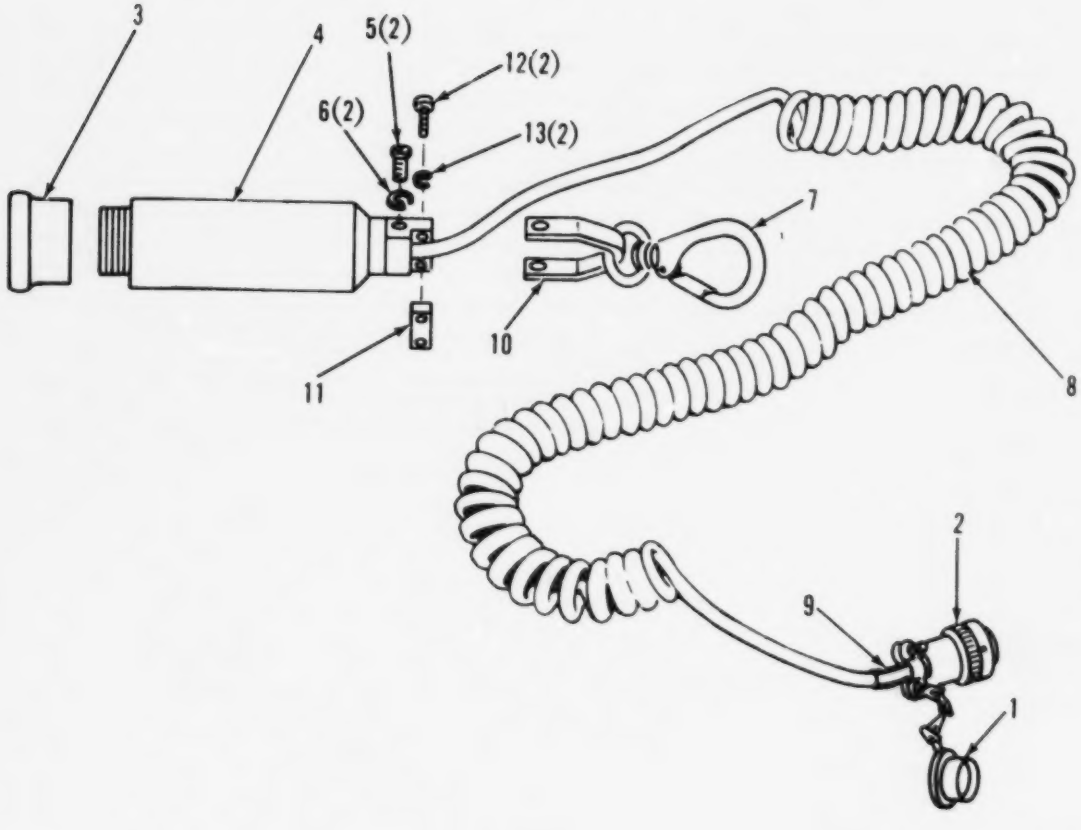


Figure C-20. Lanyard switch

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1306 LANYARD ASSEMBLY		
						11746480		
C-20	1	PAFZZ	5935-00-946-2091	MS3180-12C	96906	COVER, ELECTRICAL.....F59	EA	1
C-20	2	PAFZZ	5935-00-943-6712	MS3116F-12-3P	96906	TARGET ASSEMBLY, PLUG.....F59	EA	1
C-20	3	PAFZZ	5935-00-946-2091	11746486	19200	COVER, ELECTRICAL CONNECTOR.....F59	EA	1
C-20	4	XAFZZ		11746483	19200	HANDLE.....F59	EA	1
C-20	5	PAFZZ	5305-00-054-6667	MS51957-42	96906	SCREW, MACHINE.....F59	EA	2
C-20	6	PAFZZ	5310-00-933-8119	MS35338-137	96906	WASHER, LOCK.....F59	EA	4
C-20	7	XDFZZ		11746489	19200	SNAP, EYE, SWIVEL.....F59	EA	1
C-20	8	XAFZZ		11746481	19200	CABLE, RETRACTILE.....F59	EA	1
C-20	9	MFFZZ				INSULATION SLEEVING C1-.5008 (MANUFACTURED FROM MIL-I-23053/5).....F59	EA	V
C-20	10	XDFZZ		11746488	19200	LINK.....F59	EA	1
C-20	11	PADZZ	6920-01-032-2474	11746493	19200	CLAMP, CABLE.....F59	EA	1
C-20	12	PAFZZ	5305-00-054-6671	MS51957-46	96906	SCREW, MACHINE.....F59	EA	1
C-20	13	PAFZZ	5310-00-929-6365	MS35338-136	96906	WASHER, LOCK.....F59	EA	2

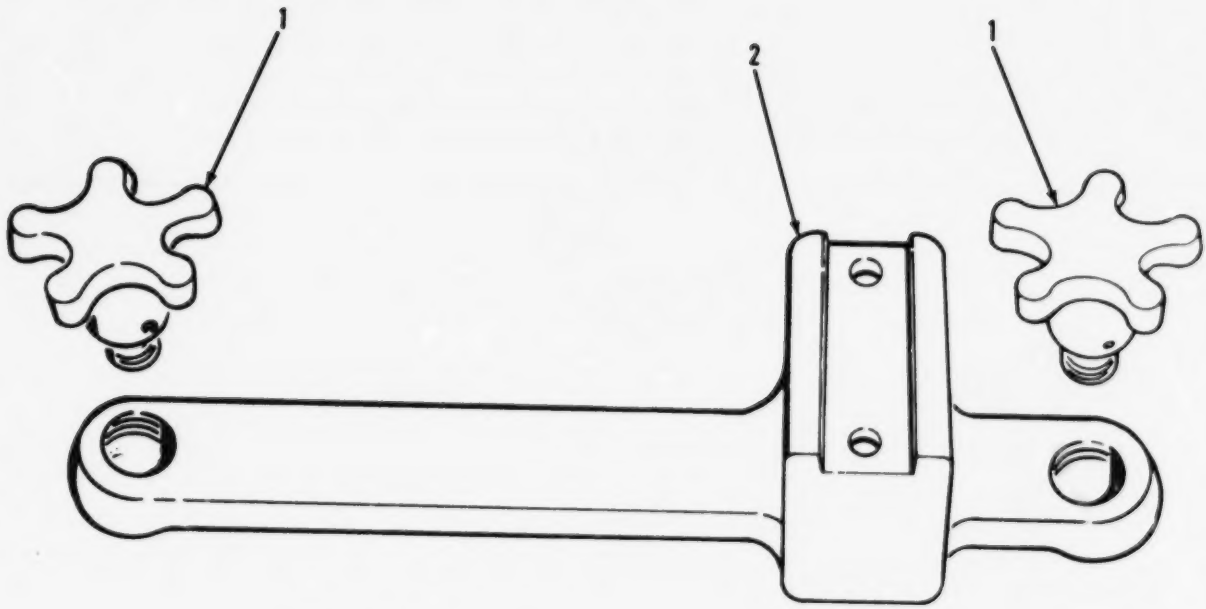


Figure C-21. Adapter assembly

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1307 ADAPTER ASSEMBLY		
						11747146		
C-21	1	XDFZZ		11746516	19200	KNOB, SPECIAL.....F59	EA	2
C-21	2	XDDZZ		11746518	19200	ADAPTER.....F59	EA	1

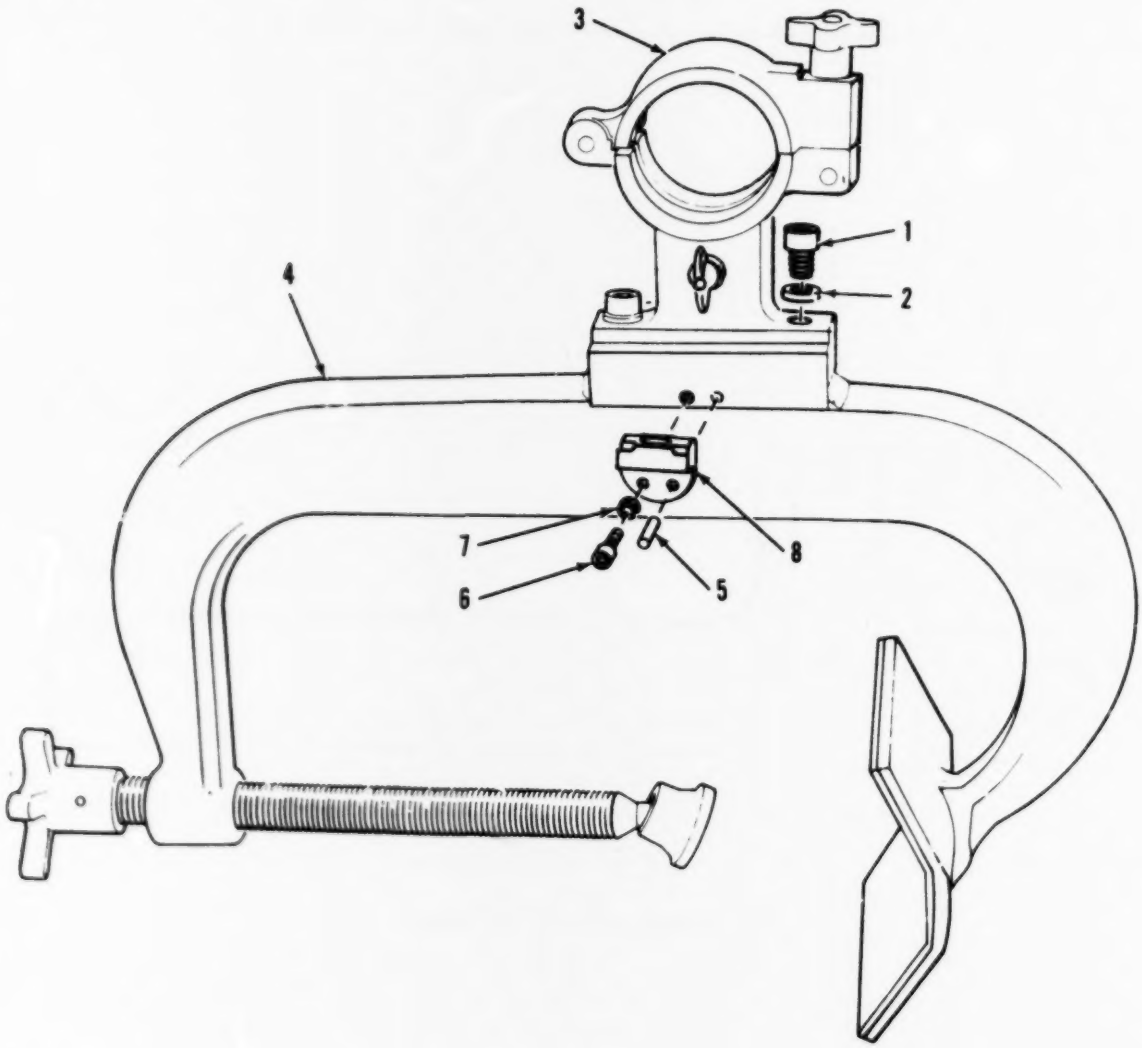


Figure C-22. Mount assembly

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1308 MOUNT ASSEMBLY		
						11747149		
C-22	1	PPFZZ	5305-00-990-0668	MS16995-81	96906	SCREW, CAP, SOCKET HEAD.....F59	EA	2
C-22	2	PAFZZ	5310-00-584-7642	MS35338-141	96906	WASHER, LOCK.....F59	EA	2
C-22	3	XDFDL		11746495	19207	MOUNT.....F59	EA	1
C-22	4	XDFDL		11746491	19207	CLAMP.....F59	EA	1
C-22	5	PADZZ	5315-00-732-9651	MS16555-618	96906	PIN, STRAIGHT, HEADLESS.....F59	EA	2
C-22	6	PADZZ	5305-00-054-5649	MS51957-15	96906	SCREW, MACHINE.....F59	EA	4
C-22	7	PADZZ	5310-00-933-8118	MS35338-135	96906	WASHER, LOCK.....F59	EA	2
C-22	8	PADZZ	6920-01-024-9849	11736263	19207	LEVEL VIAL ASSEMBLY.....F59	EA	2

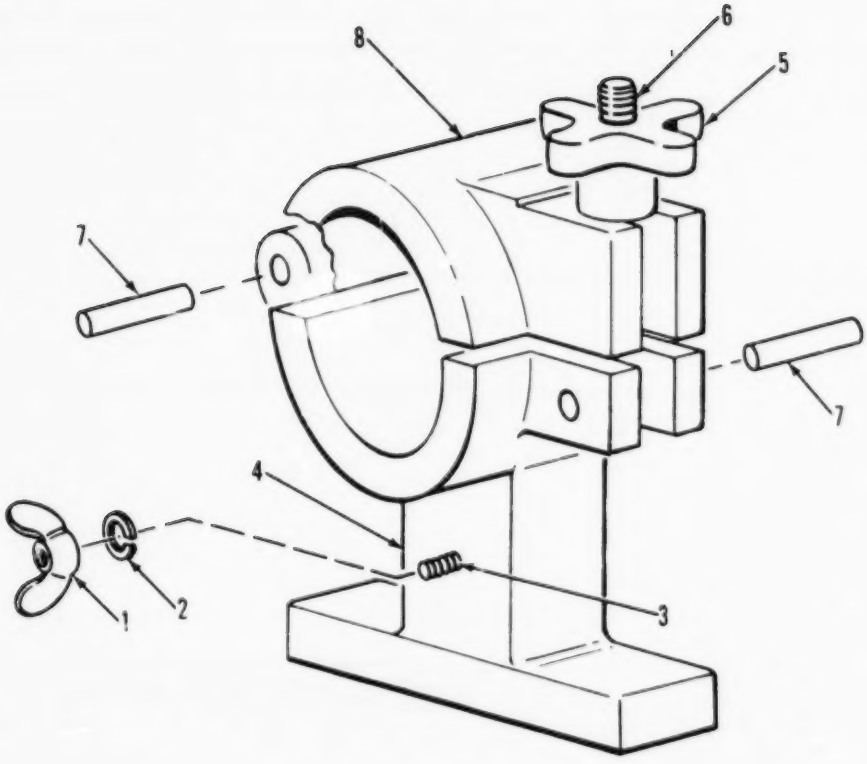


Figure C-23. Mount

SECTION II

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
						GROUP 132801 MOUNT		
						11746495		
C-23	1	PAFZZ	5310-00-515-9267	MS35425-37	96906	NUT, PLAIN, WING	EA	1
C-23	2	PAFZZ	5310-00-543-9533	MS35333-73	96906	WASHER, LOCK	EA	4
C-23	3	PAFZZ	5305-00-877-8739	MS51021-49	96906	SETSCREW	EA	4
C-23	4	XBDZZ		11746457	19207	BASE	EA	4
C-23	5	PBDZZ		11746499	19207	KNOB, HAND	EA	4
C-23	6	PBDZZ	5306-01-054-4555	11746498	19207	BOLT, EYE	EA	4
C-23	7	PBDZZ	5315-00-551-3215	MS16555-648	96906	PIN, STRAIGHT, HEADLESS	EA	2
C-23	8	XCDZZ		11746496	19207	CLAMP	EA	4

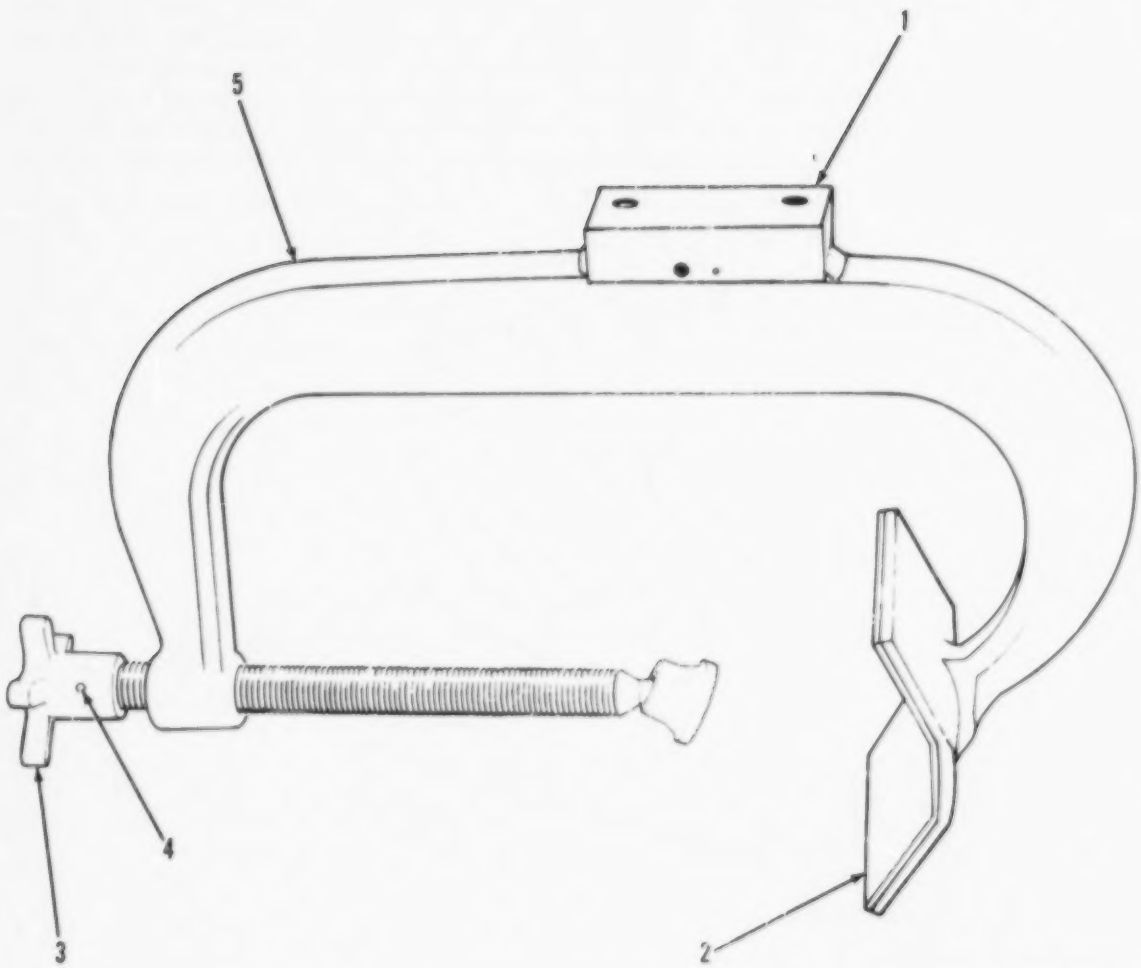
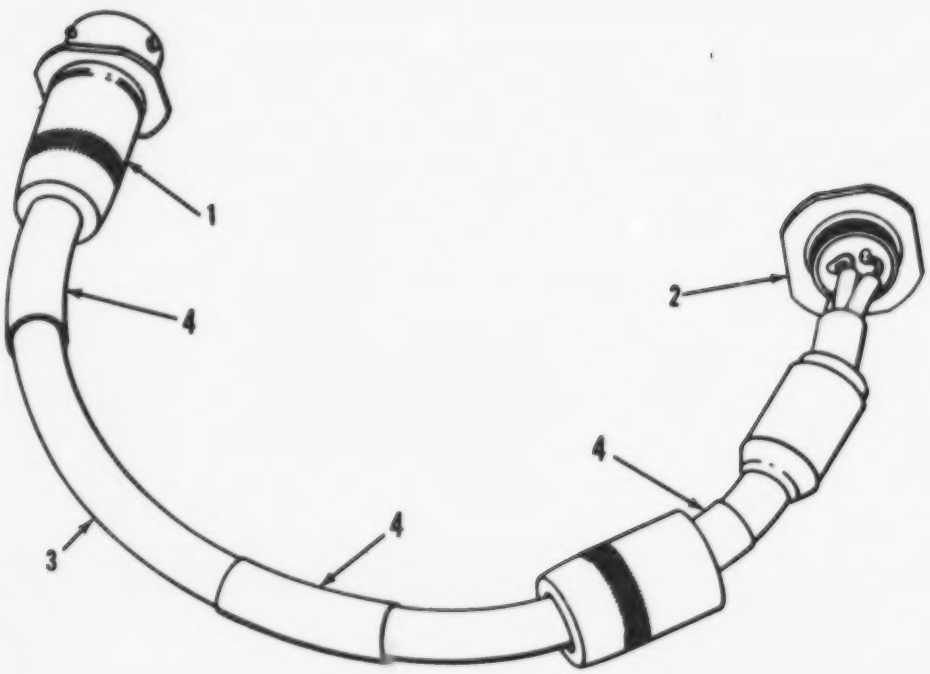


Figure C-24. Clamp

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 100402 CLAMP		
						11746491		
C-24	1	HBDZZ		11746491-1	19200	BLOCK.....F59	EA	1
C-24	2	HBDZZ		11746492	19200	JAW.....F59	EA	1
C-24	3	PADZZ	5355-01-024-5515	11746500-2	19200	KNOB.....F59	EA	1
C-24	4	PADZZ	5315-00-421-4962	MS91929-420	96906	PIN, SPRING.....F59	EA	1
C-24	5	HBDZZ		11746494	19200	CLAMP.....F59	EA	1



AR 911821

Figure C-25. Adapter cable assembly (20 ft)

(1) ILLUSTRATION (a) FIG. NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1309 ADAPTER CABLE ASSEMBLY		
						11767152		
C-29	1	PAFZZ	6920-01-028-4576	11767455-1	19200	CONNECTOR, CABLE, PLUG.....F59	EA	4
C-29	2	PAFZZ	6920-01-028-4575	11767455-2	19200	CONNECTOR, CABLE, PLUG.....F59	EA	1
C-29	3	XAFZZ				CABLE-CO2:GF (MANUFACTURED FROM MIL-C-3432).....F59	EA	V
C-29	4	HFFZZ				INSULATION SLEEVING (MANUFACTURED FROM MIL-I-23053/5).....F59	EA	V

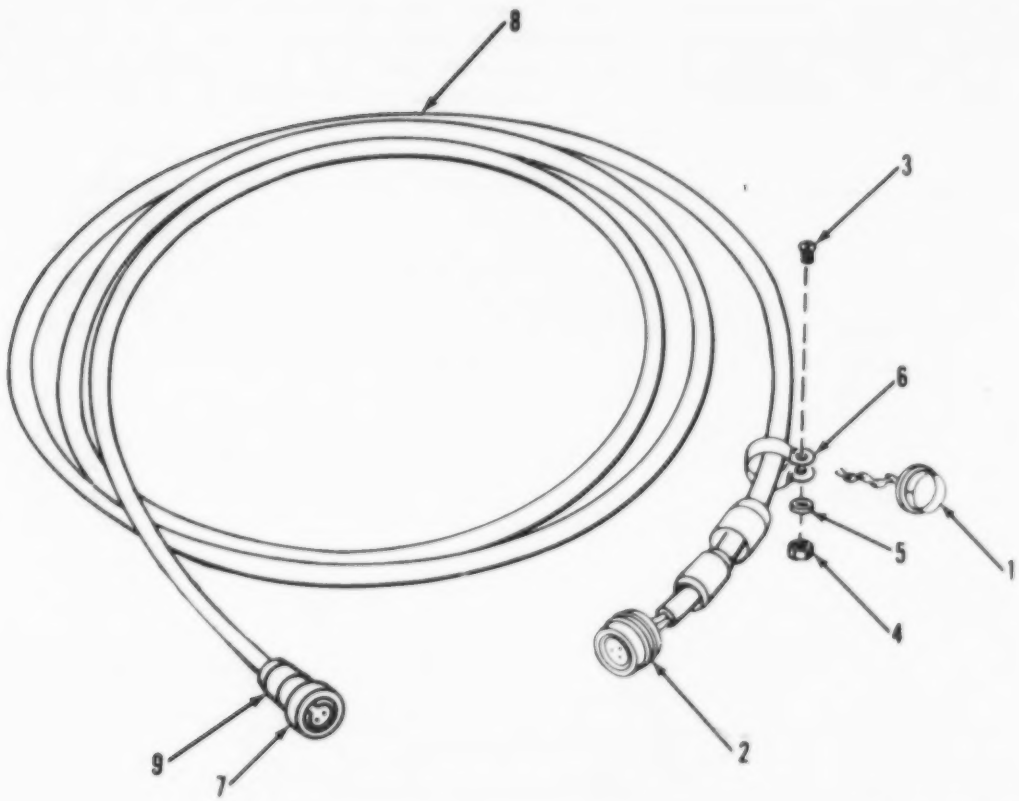
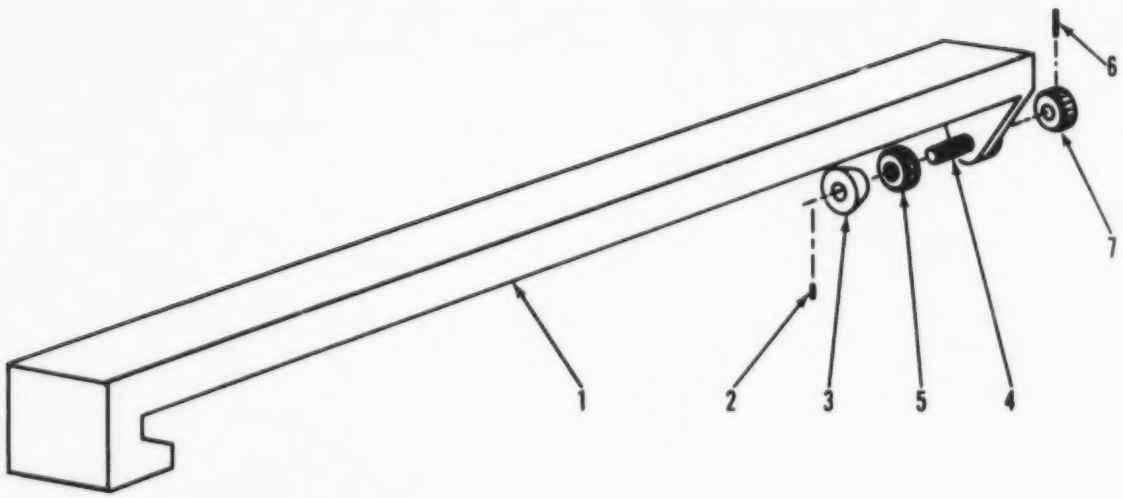


Figure C-26. Cable assembly (M109)

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1013 CABLE ASSEMBLY		
						11747170		
C-26	1	PAFZZ	5935-00-946-2691	MS3106C-.2C	96906	COVER, ELECTRICAL.....F59	EA	A
C-26	2	PAFZZ	5935-01-025-6477	11746453-1	19200	CONNECTOR, PLUG, ELECTRICAL.....F59	EA	A
C-26	3	PAFZZ	5305-00-054-6652	MS51957-28	96906	SCREW, MACHINE.....F59	EA	A
C-26	4	PAFZZ	5310-00-934-9761	MS35649-264	96906	NUT, PLAIN, HEXAGON.....F59	EA	A
C-26	5	PAFZZ	5310-00-616-3559	MS35333-71	96906	WASHER, LOCK.....F59	EA	A
C-26	6	PAFZZ	5340-00-685-0557	MS122911	96906	CLAMP, LOOP.....F59	EA	A
C-26	7	PAFZZ	1240-00-073-5136	8044364	19207	PLUG, STRAIGHT.....F59	EA	A
C-26	8	XAFZZ				CABLE, POWER, ELECTRIC (MANUFACTURED FROM MIL-C-3432).....F59	FT	V
C-26	9	HFFZZ				INSULATING SLEEVING C2-.5038 (MANUFACTURED FROM MIL-I-23053/5).....F59	FT	V



AR 911853

Figure C-27. Base assembly

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO	(1) ILLUSTRATION (b) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1011 BASE ASSEMBLY		
						11746509		
C-27	1	XDDZZ		11746501	19200	CHANNEL.....P59	EA	1
C-27	2	PADZZ	5315-00-823-8740	MS16562-152	96906	PIN, SPRING.....P59	EA	1
C-27	3	XDDZZ		11746508	19200	WEDGE.....P59	EA	4
C-27	4	XDDZZ		11746506	19200	SCREW, SPECIAL.....P59	EA	3
C-27	5	XDDZZ		11746507	19200	NUT, LOCKING.....P59	EA	4
C-27	6	PADZZ	5315-00-753-3853	MS16562-226	96906	PIN, SPRING.....P59	EA	4
C-27	7	XDDZZ		11746505	19200	KNOB.....P59	EA	4

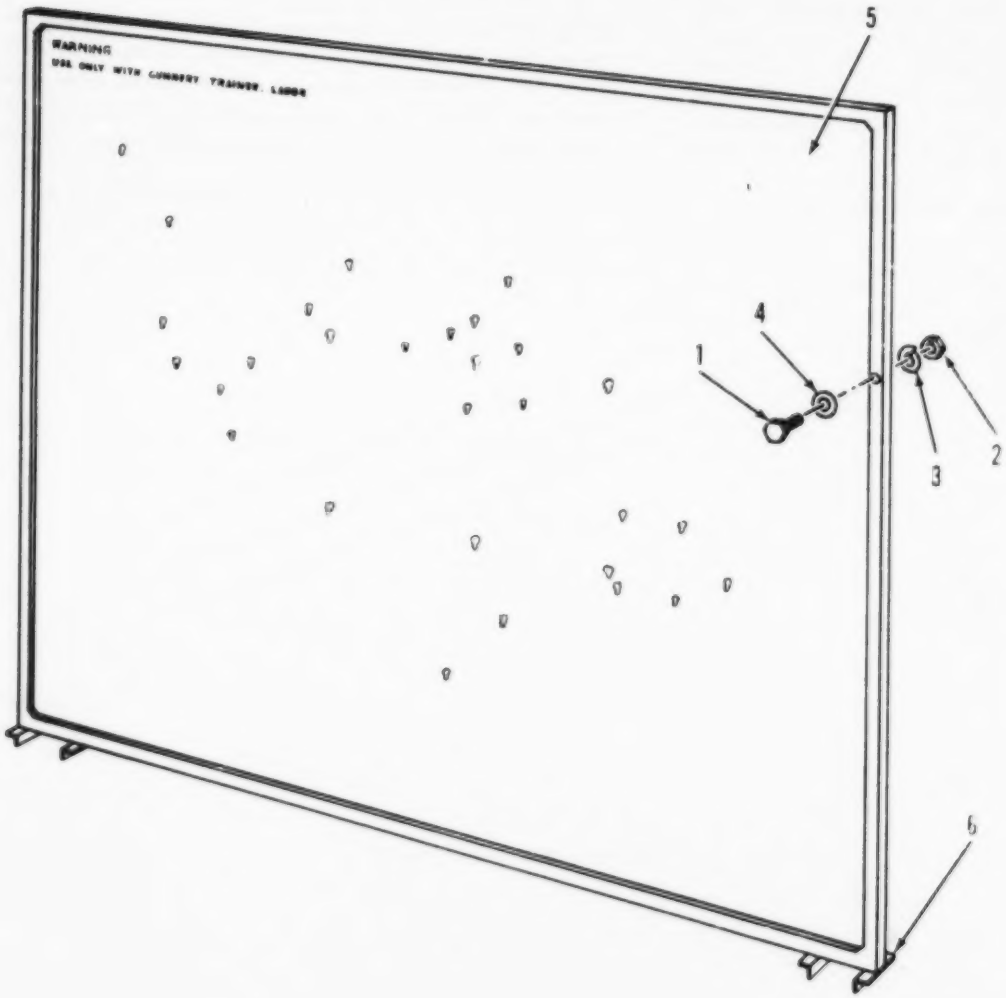


Figure C-28. (Target) support assembly

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1012 SUPPORT ASSEMBLY		
						11746502		
C-28	1	PAFZZ	5305-00-782-4523	MS35307-306	96906	SCREW, CAP, HEXAGON.....F59	EA	20
C-28	2	PAFZZ	5310-00-250-9477	MS35649-2254	96906	NUT, PLAIN, HEXAGON.....F59	EA	20
C-28	3	PAFZZ	5310-00-933-8121	MS35338-139	96906	WASHER, LOCK.....F59	EA	20
C-28	4	PAFZZ	5310-00-582-5677	MS15795-810	96906	WASHER, FLAT.....F59	EA	20
C-28	5	XDFZZ	6920-01-026-5255	11746463	19200	TARGET, 80/RC.....F59	EA	1
C-28	6	XDDZZ		11746511	19200	FRAME ASSEMBLY.....F59	EA	1

SECTION II

TM 9-6920-357-24P

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION / USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP 1900 BULK SUPPLIES		
BULK		PADZZ				TWINE, IMPREGNATED.....A30	EA	
BULK		PADZZ		MIL-W-16878/4	81349	WIRE, ELECTRIC-E-14-R.....A30	EA	
BULK		PADZZ		MIL-W-16878/4	81349	WIRE, ELECTRIC-22-R.....A30	EA	
BULK		PADZZ		MIL-I-003190/5	81349	INSULATION SLEEVING.....A30	EA	
BULK		PADZZ		QQ-W-343	81348	WIRE.....A30	EA	
BULK		PADZZ		MIL-I-003190/5-22	81349	INSULATION SLEEVING.....A30	EA	
BULK		PAFZZ	6145-01-064-8818	MIL-C-13486/1	81349	CABLE, TYPE 1, CLASS A, COLOR BLACK.....F59	EA	
BULK		PAFZZ	5970-00-954-1624	MIL-I-23053/5	81349	INSULATION SLEEVING C1-.3750.....F59	EA	
BULK		PAFZZ	6145-00-548-1258	MIL-C-3432	81349	CABLE, POWER.....F59	EA	
BULK		PAFZZ	5970-00-914-3118	MIL-I-23053/5	81349	INSULATION SLEEVING C1-.9008.....F59	EA	
BULK		PAFZZ		MIL-I-23053/5	81349	INSULATION SLEEVING C1-.2508.....F59	EA	
BULK		PAFZZ	6145-00-548-1258	MIL-C-3432	81349	CABLE-CO2HGF.....F59	EA	
BULK		PAFZZ		MIL-I-23053/5	81349	INSULATION SLEEVING.....F59	EA	

SECTION IV NATIONAL STOCK NUMBER AND PART NUMBER INDEX TM 9-6920-357-24&P

STOCK NUMBER	FIGURE NO.	ITEM NO.
5305-00-050-9229	C-14	1
5305-00-051-4484	C-16	32
5305-00-051-8499	C-17	4
5305-00-054-5637	C-14	14
5305-00-054-5646	C-16	6
5305-00-054-5648	C-7	1
5305-00-054-5648	C-8	9
5305-00-054-5649	C-22	6
5305-00-054-5653	C-7	18
5305-00-054-6652	C-18	3
5305-00-054-6652	C-19	2
5305-00-054-6652	C-26	3
5305-00-054-6652	C-5	9
5305-00-054-6667	C-20	5
5305-00-054-6668	C-5	24
5305-00-054-6671	C-20	12
5305-30-057-0497	C-2	7
5305-00-057-0516	C-16	41
5305-00-057-0516	C-16	42
5310-00-058-1823	C-5	34
2640-00-060-3543	C-3	5
5305-00-068-5276	C-5	26
5305-00-068-5419	C-8	5
5910-00-069-0369	C-6	18
5961-00-069-2469	C-7	15
1240-00-073-5136	C-26	7
5305-00-085-4056	C-16	34
5935-00-086-2369	C-15	2
8935-00-086-2369	C-17	11
5905-00-103-7437	C-7	51
5910-00-103-7553	C-6	29
5905-00-106-1245	C-6	21
5905-00-106-1278	C-6	26
5905-00-106-1356	C-7	38
5905-00-106-3666	C-6	27
5905-00-110-7620	C-7	45
5905-00-110-7622	C-6	7
5910-00-111-4811	C-6	6
5910-00-111-4811	C-7	34
5305-00-111-5540	C-3	7
5306-00-111-5542	C-3	12
5905-00-111-8372	C-6	22
5905-00-114-0711	C-7	46
2640-00-114-1096	C-3	6
5935-00-115-2307	C-15	6
5935-00-131-9680	C-6	20
5935-00-131-9680	C-7	41
5935-00-131-9693	C-6	23
5935-00-131-9693	C-7	44
5935-00-131-9696	C-7	42
5935-00-131-9696	C-7	43
5999-00-132-0012	C-7	30
5970-00-133-3786	C-7	13
5970-00-133-4840	C-7	22
5905-00-141-0717	C-6	9
5905-00-141-1183	C-7	50
5940-00-143-4774	C-5	24
5310-00-146-7102	C-17	10
5310-00-147-0812	C-7	21
5325-00-174-5317	C-8	13
5325-00-185-0017	C-15	7
5315-00-187-3241	C-16	13
5999-00-204-8350	C-19	7
5999-00-204-8350	C-19	8
5305-00-207-8253	C-12	27
5905-00-212-3574	C-6	19
5905-00-243-9035	C-7	52
6920-00-248-2572	C-5	3
6920-00-248-2578	C-2	11
6920-00-248-2580	C-9	2
6920-00-248-2583	C-5	13
6920-00-248-2681	C-7	9
5310-00-250-9477	C-12	30
5310-00-250-9477	C-28	2
6920-00-251-7507	C-3	10
6920-00-251-7508	C-3	2
6920-00-251-7509	C-3	3
6920-00-251-7511	C-4	1
6920-00-251-7515	C-4	2
6920-00-251-7518	C-5	11
6920-00-251-7519	C-6	1
6920-00-251-7519	C-7	10
6920-00-251-7523	C-2	1
6920-00-251-7527	C-5	1
6920-00-260-6060	C-5	4
5315-00-262-1644	C-3	11
3010-00-269-9985	C-14	6
5920-00-280-4431	C-19	10
6210-00-282-8906	C-5	31
5940-00-283-9967	C-10	1
5325-00-286-6047	C-8	14
5330-00-294-9715	C-3	14
3120-00-301-3943	C-8	2
5950-00-305-4229	C-7	19
6210-00-319-8712	C-5	33
5910-00-320-7653	C-6	28
9320-00-342-9749	C-10	4
5999-00-349-6193	C-3	15
5999-00-349-6194	C-5	23
6920-00-393-0268	C-3	16
5310-00-404-1433	C-7	12
5961-00-404-9136	C-7	39
5930-00-412-3790	C-5	27
5905-00-417-7278	C-6	14
5905-00-419-2822	C-7	33
5961-00-421-3002	C-7	31
5315-00-421-4962	C-24	4
5961-00-429-1907	C-7	24
5962-00-429-5638	C-7	29
5905-00-432-0356	C-7	37
5340-00-435-8980	C-8	11
1220-00-460-2585	C-13	2
5905-00-472-1064	C-7	49
5905-00-481-8158	C-6	25
5905-00-485-4545	C-7	53
6210-00-487-3011	C-5	28
5905-00-496-4334	C-5	35
5915-00-506-4167	C-5	19
5999-00-515-2068	C-5	20
5310-00-515-9267	C-23	1
5310-00-543-2740	C-12	29
5310-00-543-4652	C-2	8
5310-00-543-5933	C-23	2
6145-00-548-1258	BULK	
6145-00-548-1258	BULK	
5310-00-550-3715	C-7	2
5330-00-580-2275	C-3	4
5310-00-582-5677	C-12	28
5310-00-582-5677	C-28	4
5310-00-595-6211	C-16	7
5310-00-595-6211	C-7	17
5310-00-595-6761	C-2	9
5310-00-616-3555	C-18	5
5310-00-616-3555	C-19	4
5310-00-616-3555	C-26	5
5310-00-655-6930	C-7	23
5340-00-692-2474	C-3	1
5940-00-682-2477	C-5	17
5340-00-685-0557	C-18	6
5340-00-685-3557	C-19	5
5340-00-685-0557	C-26	6
5310-00-685-2631	C-7	11
5305-00-702-4523	C-28	1
5315-00-702-9651	C-22	5
5999-00-713-0913	C-6	11
5999-00-713-0913	C-7	26
5305-00-717-6955	C-16	27
5320-00-721-5244	C-17	12
5305-00-724-6740	C-16	40
5305-00-725-3626	C-14	23
1290-00-726-0813	C-16	30
5305-00-728-5486	C-16	15
5305-00-738-0624	C-5	9
5340-00-753-3456	C-14	3
5315-00-753-3893	C-27	6
6240-00-763-7744	C-5	29
5305-00-766-2422	C-9	3
1240-00-777-1372	C-14	18
5940-00-800-5102	C-15	8
5315-00-826-7639	C-14	5

STOCK NUMBER	FIGURE NO.	ITEM NO.
5315-00-886-7040	C-14	20
5330-00-806-8769	C-5	26
5315-00-817-0889	C-16	32
5315-00-823-8740	C-27	2
5940-00-827-2693	C-5	6
5925-00-836-6173	C-5	25
5961-00-842-9609	C-7	32
5935-00-845-2537	C-15	3
5935-00-845-2537	C-17	2
5961-00-848-7007	C-7	48
5961-00-866-5454	C-6	13
5305-00-877-8739	C-23	3
5310-00-878-3292	C-6	3
5310-00-878-3292	C-7	5
5365-00-878-9987	C-16	28
5315-00-882-1438	C-14	13
5961-00-883-1511	C-6	8
5961-00-892-0734	C-6	12
5961-00-892-3513	C-7	35
6240-00-892-4420	C-5	32
4820-00-906-1039	C-11	8
5961-00-911-6015	C-6	17
5935-00-913-1823	C-15	5
5935-00-913-1823	C-17	1
5970-00-914-3118	BULK	
5310-00-928-2690	C-8	6
5310-00-929-6395	C-17	9
5310-00-929-6395	C-20	13
5310-00-929-6395	C-3	9
5310-00-929-6395	C-5	7
5905-00-931-2026	C-7	36
5310-00-933-8118	C-22	7
5310-00-933-8118	C-5	18
5310-00-933-8119	C-20	6
5310-00-933-8119	C-5	15
5310-00-933-8120	C-14	2
5310-00-933-8120	C-3	13
5310-00-933-8121	C-14	24
5310-00-933-8121	C-28	3
5310-00-933-8121	C-5	2
5310-00-934-9761	C-18	4
5310-00-934-9761	C-19	3
5310-00-934-9761	C-26	4
1240-00-936-5400	C-16	31
1240-00-936-8762	C-16	29
5310-00-939-0849	C-5	20
5310-00-939-0849	C-7	16
5310-00-939-0849	C-8	10
5305-00-940-9491	C-17	8
5935-00-943-6712	C-20	2
5935-00-946-2091	C-18	1
5935-00-946-2091	C-19	1
5935-00-946-2091	C-20	1
5935-00-946-2091	C-20	3
5935-00-946-2091	C-26	1
5315-00-951-3215	C-23	7
5961-00-951-8757	C-6	15
5961-00-951-8757	C-7	27
5970-00-954-1624	BULK	
5999-00-958-6759	C-6	16
5999-00-958-6759	C-7	28
5305-00-959-0379	C-6	2
5305-00-959-0379	C-7	4
5305-00-959-1082	C-3	8
5961-00-959-8549	C-6	10
5940-00-983-6046	C-17	7
5310-00-984-7042	C-22	2
5305-00-990-0668	C-22	1
5330-00-993-4916	C-13	3
5961-00-995-2319	C-7	47
5905-00-997-9352	C-7	54
5961-00-998-9224	C-7	25
5910-01-004-9279	C-7	40
5305-01-024-5463	C-16	33
5305-01-024-5472	C-14	10
5935-01-024-5498	C-18	2
5355-01-024-5515	C-24	3
6920-01-024-5776	C-14	12
6920-01-024-5777	C-14	22
6920-01-024-9048	C-16	38
6920-01-024-9049	C-22	8
6920-01-024-9050	C-12	8
6920-01-024-9051	C-16	14
6920-01-024-9205	C-12	21
6920-01-025-4597	C-12	5
6920-01-025-4599	C-12	13
6920-01-025-4630	C-12	16
6920-01-025-4601	C-12	15
5935-01-025-6477	C-18	7
5935-01-025-6477	C-19	6
5935-01-025-6477	C-26	2
5340-01-025-6558	C-14	8
6920-01-026-2971	C-1	5
6920-01-026-2972	C-12	25
6920-01-026-2973	C-12	26
6920-01-026-3221	C-1	2
5315-01-026-4735	C-16	4
6920-01-026-5255	C-28	5
6920-01-026-6577	C-1	8
6920-01-026-6660	C-16	9
6920-01-026-9382	C-1	7
6920-01-026-9383	C-12	19
7690-01-027-3395	C-2	2
5340-01-027-4218	C-12	3
6920-01-027-8353	C-12	23
6920-01-027-8356	C-16	8
6920-01-028-2433	C-12	20
6920-01-028-4568	C-12	12
6920-01-028-4569	C-16	37
6920-01-028-4570	C-12	18
6920-01-028-4571	C-12	17
6920-01-028-4572	C-12	7
6920-01-028-4575	C-25	2
6920-01-028-4576	C-25	1
6920-01-028-4581	C-1	6
6920-01-028-5289	C-16	19
6920-01-030-3418	C-12	10
6920-01-030-5224	C-12	9
6920-01-031-6106	C-16	12
6920-01-031-7276	C-16	11
6920-01-031-9068	C-1	3
6920-01-032-0279	C-1	4
6920-01-032-2474	C-20	11
6110-01-032-5121	C-12	4
5310-01-033-1194	C-14	11
6920-01-033-2325	C-16	10
6920-01-033-3683	C-12	6
5935-01-033-5275	C-6	24
7690-01-035-1444	C-2	3
5340-01-035-9243	C-14	7
5340-01-035-9244	C-14	21
8140-01-037-6338	C-12	22
5970-01-037-8912	C-16	3
6210-01-038-3727	C-5	30
7690-01-038-5515	C-2	5
6920-01-039-8539	C-12	24
7690-01-040-0606	C-2	4
7690-01-040-0606	C-7	7
6920-01-051-2016	C-12	1
5306-01-054-4565	C-23	6
1240-01-054-5590	C-12	2
6920-01-057-1622	C-14	9
1095-01-057-6586	C-12	11
6920-01-058-5913	C-16	16
6920-01-059-0394	C-12	14
5310-01-063-1762	C-7	23
6145-01-064-8818	BULK	
5930-01-064-9959	C-15	1
5365-01-065-3728	C-7	14
5340-01-066-3983	C-8	12

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AN960C10L	81352	C-7	21
CK05BX103K	81349	C-6	6
CK05BX103K	81349	C-7	34
CK05BX472K	81349	C-6	29
FD9A250V10A5	81349	C-19	10
JAN1N4838	81349	C-6	22
JAN1N5550	81349	C-7	31
JAN1N5615	81349	C-7	39
JAN1N752A	81349	C-7	47
JAN1N821	81349	C-6	13
JAN1N9418	81349	C-6	8
JAN1N9668	81349	C-7	32
JAN1N9688	81349	C-7	48
JAN2N1724	81349	C-7	15
JAN2N1E71A	81349	C-6	10
JAN2N2222A	81349	C-6	15
JAN2N2222A	81349	C-7	27
JAN2N3251A	81349	C-6	17
JAN2N3635	81349	C-7	25
MIL-C-13486/1	81349	BULK	
MIL-C-3432	81349	BULK	
MIL-C-3432	81349	BULK	
MIL-I-003190/5	81349	BULK	
MIL-I-003190/5-22	81349	BULK	
MIL-I-23053/5	81349	BULK	
MIL-I-23053/5	81349	BULK	
MIL-I-23053/5	81349	BULK	
MIL-I-23053/5	81349	BULK	
MIL-W-16878/4	81349	BULK	
MIL-W-16878/4	81349	BULK	
MILT55164	81349	C-17	7
MS122911	96906	C-18	6
MS122911	96906	C-19	5
MS122911	96906	C-26	6
MS15795-802	96906	C-2	9
MS15795-803	96906	C-16	7
MS15795-803	96906	C-7	17
MS15795-810	96906	C-12	28
MS15795-810	96906	C-28	4
MS16535-77	96906	C-17	12
MS16535-601	96906	C-16	32
MS16535-606	96906	C-14	5
MS16535-618	96906	C-22	5
MS16535-620	96906	C-14	20
MS16535-648	96906	C-23	7
MS16562-192	96906	C-27	2
MS16562-193	96906	C-14	13
MS16562-226	96906	C-27	6
MS16626-4118	96906	C-16	1
MS16995-10	96906	C-6	2
MS16995-15	96906	C-7	4
MS16995-18	96906	C-3	8
MS16995-2	96906	C-8	5
MS16995-81	96906	C-22	1
MS16995-9	96906	C-5	16
MS17188-1	96906	C-7	12
MS18014-1	96906	C-11	8
MS18209-387	96906	C-5	29
MS2027086	96906	C-14	6
MS20470004-10-5	96906	C-13	6
MS20470004-12	96906	C-13	7
MS21042-02	96906	C-5	34
MS21043-04	96906	C-6	3
MS21043-04	96906	C-7	5
MS21083C04	96906	C-5	15
MS21083C04	96906	C-7	16
MS21083C04	96906	C-8	13
MS24585-C109	96906	C-16	17
MS24585-C423	96906	C-16	21
MS24612K312	96906	C-15	1
MS24626-1	96906	C-17	4
MS24630-12	96906	C-7	8
MS24692-54	96906	C-16	13
MS25036-153	96906	C-5	24
MS25082-C1	96906	C-17	10
MS25082-3	96906	C-7	20
MS25082-4	96906	C-7	11
MS25178-10	96906	C-3	1
MS25196-1	96906	C-5	26
MS25252C74	96906	C-5	32

PART NUMBER	FSCM	FIG. NO.	ITEM NO.
MS25281R2	96906	C-14	3
MS27144-2	96906	C-15	6
MS27719-23	96906	C-5	27
MS3114E-12-35	96906	C-15	2
MS3114E-12-35	96906	C-17	11
MS3114E12-3P	96906	C-15	3
MS3114E12-3P	96906	C-17	2
MS3116F-12-3P	96906	C-20	2
MS3180-12C	96906	C-18	1
MS3180-12C	96906	C-19	1
MS3180-12C	96906	C-20	1
MS3180-12C	96906	C-24	1
MS3181-12N	96906	C-15	5
MS3181-12N	96906	C-17	1
MS3212-1	96906	C-5	9
MS3212-39	96906	C-16	34
MS35275-230	96906	C-17	8
MS35307-304	96906	C-14	23
MS35307-306	96906	C-28	1
MS35307-308	96906	C-12	27
MS35333-69	96906	C-2	8
MS35333-70	96906	C-7	2
MS35333-71	96906	C-18	5
MS35333-71	96906	C-19	4
MS35333-71	96906	C-26	5
MS35333-73	96906	C-23	2
MS35333-74	96906	C-12	29
MS35338-134	96906	C-8	6
MS35338-135	96906	C-22	7
MS35338-135	96906	C-5	18
MS35338-136	96906	C-17	9
MS35338-136	96906	C-20	13
MS35338-136	96906	C-3	9
MS35338-136	96906	C-5	7
MS35338-137	96906	C-20	6
MS35338-137	96906	C-5	19
MS35338-138	96906	C-14	2
MS35338-138	96906	C-2	13
MS35338-139	96906	C-14	24
MS35338-139	96906	C-28	3
MS35338-139	96906	C-5	2
MS35338-141	96906	C-22	2
MS35425-37	96906	C-23	1
MS35440-1	96906	C-15	8
MS35489-33	96906	C-15	7
MS35489-4	96906	C-8	13
MS35490-1	96906	C-8	14
MS35649-2254	96906	C-12	30
MS35649-2254	96906	C-28	2
MS35649-264	96906	C-18	4
MS35649-264	96906	C-19	3
MS35649-264	96906	C-26	4
MS51021-49	96906	C-23	3
MS51377-2	96906	C-3	5
MS51607-1	96906	C-5	6
MS51923-420	96906	C-24	4
MS51957-12	96906	C-16	6
MS51957-14	96906	C-7	1
MS51957-14	96906	C-8	9
MS51957-15	96906	C-22	6
MS51957-19	96906	C-7	18
MS51957-28	96906	C-18	3
MS51957-28	96906	C-19	2
MS51957-28	96906	C-26	3
MS51957-28	96906	C-5	5
MS51957-3	96906	C-14	14
MS51957-42	96906	C-26	5
MS51957-43	96906	C-5	14
MS51957-46	96906	C-20	12
MS51957-63	96906	C-24	1
MS51958-1	96906	C-2	7
MS51958-19	96906	C-16	41
MS51958-19	96906	C-18	42
MS51959-1	96906	C-8	3
MS51963-1	96906	C-16	27
MS51965-19	96906	C-18	40
MS51973-1	96906	C-16	15
MS51973-2	96906	C-14	35
MS77068-1	96906	C-5	17
MS77068-2	96906	C-5	6

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MS9021-114	96906	C-8	4
MS9021-327	96906	C-3	14
M24066-2-109	81349	C-17	13
M39000-01-2358	81349	C-6	18
M39006/01-8535	81349	C-7	40
M39019-1-31	81349	C-5	25
M39022-01-1126	81349	C-6	28
M39024-11-01	81349	C-6	20
M39024-11-01	81349	C-7	41
M39024-11-02	81349	C-6	24
M39024-11-03	81349	C-6	23
M39024-11-03	81349	C-7	44
M39024-11-04	81349	C-7	42
M39024-11-04	81349	C-7	43
MS5164/7-T8LD	96906	C-17	6
MS5302/17-09	81349	C-8	1
00-W-343	81348	BULK	
MCR07G101JS	81349	C-7	50
MCR07G102JS	81349	C-7	45
MCR07G103JS	81349	C-6	27
MCR07G123JS	81349	C-6	26
MCR07G152JS	81349	C-7	38
MCR07G334JS	81349	C-7	53
MCR07G472JS	81349	C-7	46
MCR07G473JS	81349	C-6	9
MCR07G682JS	81349	C-6	7
MCR32G222JS	81349	C-6	22
MCR32G272JS	81349	C-6	21
MER65F49R9P	81349	C-5	35
MJ26FW105	81349	C-6	19
MLR07C202GR	81349	C-7	33
MLR20C162GR	81349	C-6	14
MLR20C242GR	81349	C-6	25
MNR55K1692FM	81349	C-7	37
MNR65K7503FM	81349	C-6	5
MT24C2W101	81349	C-7	51
MT24C2W103	81349	C-7	36
MVR81S2670FR	81349	C-7	52
MW81S6810FR	81349	C-7	49
MW79U1R00F	81349	C-7	54
MC440TYPEPC4	81348	C-19	7
MC440TYPEPC4	81348	C-19	8
10540766	19200	C-6	16
1N697	81349	C-7	35
10516541	19200	C-16	19
10540766	19200	C-7	28
10548625	19200	C-13	4
10548737	19200	C-13	5
10554641	19200	C-2	4
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10554643-2	19200	C-12	26
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10556451	19200	C-17	15
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11737725	19200	C-5	22
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11737726-2	19200	C-5	33
11737729	19200	C-3	15
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11737732	19200	C-6	4
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11737744	19200	C-6	35
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11737767	19200	C-10	5
11737768	19200	C-5	12
11737770	19200	C-9	1
11737771	19200	C-5	21
11737772	19200	C-8	15
11737773	19200	C-8	4
11737777	19200	C-8	2
11737778	19200	C-9	3
11737789	19200	C-5	11
11737784	19200	C-10	4
11737785	19200	C-8	7
11737787	19200	C-5	36
11737790	19200	C-5	1
11737791	19200	C-5	23
11737797	19200	C-5	20
11739801-2	19200	C-10	1
11739806	19200	C-10	2
11739807	19200	C-10	3
11739820	19200	C-7	29
11739821	19200	C-7	19
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11739834-2	19200	C-7	13
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11739855	19200	C-7	9
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11739878	19200	C-1	6
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11741680	19200	C-3	3
11741681	19200	C-4	1
11741685	19200	C-4	2
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11743789	19200	C-11	1
11746399	19200	C-13	9
11746410	19200	C-12	2
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11746413	19200	C-14	17
11746414	19200	C-14	16
11746415-1	19200	C-14	21
11746415-2	19200	C-14	8
11746415-3	19200	C-14	7
11746416	19200	C-14	22
11746417	19200	C-14	10
11746419	19200	C-14	11
11746420	19200	C-14	12
11746421	19200	C-14	9
11746422	19200	C-16	39
11746423	19200	C-16	2
11746424	19200	C-16	5
11746425	19200	C-16	4
11746426	19200	C-16	14
11746427	19200	C-16	16
11746428-1	19200	C-16	23
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11746432	19200	C-16	38
11746437	19200	C-16	37
11746441	19200	C-16	13
11746442	19200	C-16	9
11746443	19200	C-16	12
11746444	19200	C-16	11
11746446	19200	C-12	3
11746450	19200	C-12	4
11746451	19200	C-17	3
11746452	19200	C-12	5
11746453-1	19200	C-19	7
11746453-1	19200	C-19	6
11746453-1	19200	C-26	2
11746453-2	19200	C-19	2
11746454	19200	C-12	6
11746455-1	19200	C-25	1
11746455-2	19200	C-25	2
11746456	19200	C-14	4
11746457	19200	C-15	4
11746460	19200	C-28	5
11746461	19200	C-12	7
11746464	19200	C-12	8
11746468	19200	C-12	9
11746470-1	19200	C-16	22
11746470-2	19200	C-16	3
11746471	19200	C-16	24
11746475	19200	C-12	10
11746478	19200	C-17	5
11746479	19200	C-19	9
11746480	19200	C-12	11
11746481	19200	C-20	8
11746483	19200	C-20	4
11746486	19200	C-20	3
11746488	19200	C-20	10
11746489	19200	C-20	7
11746490	19200	C-20	11
11746491	19200	C-22	4
11746491-1	19200	C-24	1
11746492	19200	C-24	2
11746493	19200	C-14	15
11746494	19200	C-24	5
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11746496	19200	C-23	8
11746497	19200	C-23	4

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11746499	19200	C-23	5
11746500-2	19200	C-24	3
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11746502	19200	C-12	24
11746505	19200	C-27	7
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11746508	19200	C-27	3
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11746511	19200	C-28	6
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11746786	19200	C-11	7
11746788	19200	C-15	1
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11747155	19200	C-12	17
11747156	19200	C-12	18
11747158	19200	C-12	1
11747159	19200	C-13	12
11747160	19200	C-13	11
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APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. **Scope.** The appendix lists expendable supplies and materials you will need to operate and maintain the laser and the FADFT. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. **Explanation of Columns.**

a. *Column 1 - Item number.* This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use sealing compound, item 7, App D")

b. *Column 2 - Level.* This column identifies the lowest level of maintenance that requires the listed item.

O - Organizational Maintenance

F - Direct Support Maintenance

H - General Support Maintenance

c. *Column 3 - National Stock Number.* This is the National stock number assigned to the item; use it to request or requisition the item.

d. *Column 4 - Description.* Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. *Column 5 - Unit of Measure (U/M).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	F	6810-00-184-4796	ACETONE, TECHNICAL: O-C-265 5 gal can	GL
2	F	8040-00-833-9563	ADHESIVE, SILICONE: MIL-A-46106 (81349) 5 oz tube	OZ
3	F	6850-00-264-9039	DRY CLEANING SOLVENT: (SD) Fed P-D-680 (81348) 1 gal can	GL

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
4			ETHYL ALCOHOL, TECHNICAL: 95 percent (for cleaning optics of sighting and fire conrol equipment)	
			JAN-A-463 (81348)	
	F	6505-00-104-9000	5 gal drum	GL
5			GREASE	
			MIL-G-4343 (81349)	
	F	9150-00-269-8255	1 lb can	LB
6			HEAT SINK COMPOUND	
			11739829 (19200)	
	F		1 pt can	PT
7	F	6640-00-663-0832	PAPER, LENS: tissue, sheet form, 5 lg, type I or II	
			NNN-P-40 (81348)	
8			SOLDER, TIN-LEAD ALLOY: Sn 60	
			QQS-571 (81349)	
	F	3439-00-555-4629	Spool	LB
9			SEALING COMPOUND:	
			MIL-S-11031 (81349)	
	F	8030-00-275-8110	Kit	EA
10			TRICHLOROETHANE, TECHNICAL: liquid	
			O-T-620 (81348)	
	F	6810-00-664-0387	1 pint can	PT

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